THIS WEEK'S National Petroleum NEWS

Coming Meetings

Virginia Oil Men's Association, and Virginia Sub-Committee Code of Ethics, Patrick Henry Hotel, Roanoke, Va., Oct. 29, 30.

North Carolina Independent Oil Jobbers Association, Statesville, N. C., Nov. 4.

American Petroleum Institute annual meeting, Stevens Hotel, Chicago, Nov. 10, 11, 12.

Third International Conference on Bituminous Coal, at Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pa., Nov. 16 to 21.

Indiana Petroleum Association, Hotel Severin, Indianapolis, Ind., Dec. 2, 3.

Nebraska Petroleum Marketers, Inc., Hotel Paxton, Omaha, Neb., Dec. 9, 10, 11.

Geological Society of America, Mayo Hotel, Tulsa, Dec, 28 to 31.

1932

Northwest Petroleum Association, North Dakota division, Waldorf Hotel, Fargo, N. D., Jan. 11, 12.

Northwest Petroleum Association, Minnesota division, Radisson Hotel, Minneapolis, Minn., Jan. 14, 15.

Oklahoma Petroleum Marketers Association, Oklahoma City, Jan. 21, 22.

The Kentucky Petroleum Marketers Association, Brown Hotel, Louisville, Ky., Feb. 9.

National Petroleum News

Vol. 23 **No. 43**

Published by
The National Petroleum Publishing Co.
1213 W. Third St., Cleveland, O.
Tel. CHerry 7672

Branch Offices:
TULSA,
904 World Bldg., Tel. 3-7132.
NEW YORK,
342 Madison Ave., Tel. Vanderbilt 3-3950 and 3-3951.
HOUSTON,
2420 Gulf Bldg., Tel. Fairfax 6286.
CHICAGO,
35 E. Wacker Drive, Tel. State 4141.

Subscription rate $3.50 per year, U. S. and Mexico; Canada $6 (including duty); $5 Foreign countries. Current copies 10 cents; for back issues more than two months old 25 cents per copy.

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Member Audit Bureau of Circulations and Associated Business Papers.

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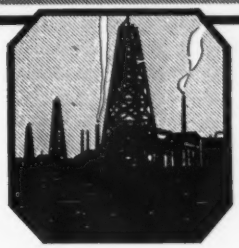
THE Oklahoma-Kansas division of the Mid-Continent Oil & Gas Association is headed for another year by Alvin Richards, as the result of action taken by the executive committee on Oct. 20. Mr. Richards is chief counsel for the Pure Oil Co.'s southwestern division, Tulsa.

He was born in Tennessee and educated in the common schools of that state and at Union college. He came to Oklahoma in 1905 and continued his study of law in schools of that state. A little later, Mr. Richards was appointed law clerk and secretary to Jesse J. Dunn, of the Oklahoma supreme court, which gave him an excellent opportunity to complete his training for formal practice. He was admitted to the bar in 1911 and established a law office in Oklahoma City.

Mr. Richards joined the legal department of the Pure Oil Co. in 1918. He has played an important part in the production curtailment work in the Mid-Continent in the past five years. He is president of the Tulsa Club and is active in other phases of civic enterprise.

NATIONAL PETROLEUM NEWS

Published at
1213 W. Third St.
Cleveland



Branch Offices
Tulsa, New York, Houston, Chicago

Vol. 23 **CLEVELAND, OCTOBER 28, 1931** **No. 43**

Oil's Part in Legislative Relief Programs an Institute Topic

CLEVELAND, Oct. 26—WHETHER to draft and embark upon its own program of legislative relief from conditions resulting from continued over-production of crude; or whether to take a hand in the programs which have been proposed by outside agencies, notably the Chamber of Commerce of the United States?

This seems to be the most pressing problem that can demand attention of the executives of the oil companies of this country when they come together in Chicago, Nov. 10 to 12, for the annual meeting of the American Petroleum Institute.

The problem is pressing, not through efforts on the part of the oil industry itself, but because Congress will be in session within a few weeks, where it is certain that efforts to secure relief legislation of some kind for industry will be made. Such efforts perhaps may not be specifically made on behalf of the oil industry but may still vitally affect its future operations.

This general meeting of the industry, under the auspices of the institute, presents the opportunity for its leaders to decide what course to take in the matter of relief legislation, or the alternative of not attempting even unified thought of the industry in the matter.

Three weeks ago, directors of the Chamber of Commerce of the United States, announced the findings of its committee on stabilization of the three natural resource industries—oil, coal and lumber, since their problems were in many ways common. This committee, in brief, proposed action by Congress to provide for the appointment of a small tribunal of federal government representatives familiar with these industries.

This tribunal would determine when a condition of over-production existed and, in such periods, authorize agreements among operators to balance supply and demand. Such agreements would be terminated upon order of the governmental tribunal when, in its opinion, a condition of over-production no longer existed.

Oil men members of the Chamber committee bringing forward that plan were R. C. Holmes, president of The Texas Co.; W. G. Skelly, president of the Skelly Oil Co., Tulsa, and Mark L. Requa, oil and mining engineer of California. The directors of the United States Chamber of Commerce authorized a referendum vote among the members of the local Chamber of Commerce bodies over the country to determine if general sentiment among business men favored this program. If that vote is affirmative, the national Chamber, following its custom, will stand ready to aid in efforts to incorporate the plan into law.

At the coming institute meeting, its directors will probably have the Chamber of Commerce program placed before them formally by the institute anti-trust law committee, chairman of which is C. B. Ames, vice president and general counsel of The Texas Co. His committee was appointed by directors last January to act in the interests of the industry in the event Congress should determine to amend the anti-trust laws. It consists of the general counsel for twelve leading oil companies.

THIS and other proposals affecting the anti-trust laws are to be considered at a general session of the institute membership Nov. 10, in the form of an address entitled "The Anti-Trust Laws and the Natural Resource Industries," by Oscar Sutro, of the Standard Oil Co. of California, a member of the institute anti-trust law committee.

It is known, also, that there is a strong feeling among some of the executives of the industry favoring legislation that would provide for some govern-

mental body to give an advance opinion on the validity of agreements in industry, where there was doubt as to whether or not they were in violation of anti-trust laws.

This group does not favor any change of the anti-trust laws, believing they are necessary for the protection of the public and industry also, but it does believe some machinery should be set up which could authoritatively inform in advance as to whether a particular restraint which had been proposed would be a violation of law, if carried out.

Senator Nye, of North Dakota, at the last session of Congress, introduced a bill giving the Federal Trade Commission authority to inform industries as to what they may or may not do without running afoul of the federal laws, before they are cited for a violation. He is known to be revising this bill preparatory to submitting it to the next Congress.

Then again, there are proponents within the industry, of adoption by the industry of its own program of relief which centers in the finding of ways and means to make effective the unit developments of new oil fields, thereby doing away with the unrestrained development of such new fields as East Texas, for example, where surplus production demoralized the price structure throughout the industry.

What is needed, it is felt, to allow the oil industry to take this step towards its own relief, is something that would force a minority of operators in a field who were not in favor of orderly development under the unit plan, to come into a plan which had the approval of a majority of operators in the field. As it is now, a relatively few operators who refuse to come in can make the entire plan ineffective by forcing the drilling by other operators of new wells to protect their own acreage.

For this authority the industry would likely have to go either to legislatures in the oil producing states, or to the national Congress, for laws making unit development of new fields compulsory. Possibly the plan proposed by the Chamber of Commerce of the United States would provide the needed authority.

Reeser Approached as Arbiter for California Industry

LOS ANGELES, Oct. 22

THE California oil industry is considering an arbiter, or general co-ordinator, to direct the efforts of the oil companies there in working out problems common to the industry.

Tentative offers to fill this position have been made to E. B. Reeser, head of the Barnsdall Corp., and now serving his third term as president of the American Petroleum Institute.

Officially Mr. Reeser would become president of the California Oil Producers Sales Agency, organized several months ago among independent oil producers, to market their crude under conditions which would not demoralize the general crude markets. The position would carry a salary large enough to allow him to devote his entire efforts to the work.

Acceptance of the position by Mr. Reeser is said to hinge upon the whole-hearted endorsement of the plan by the various elements of the oil industry in California, which have heretofore often been in disagreement as to operating and marketing policies. Of the major companies, it is understood that Standard Oil, Union, Shell, General Petroleum and Richfield (operating under Receiver William C. McDuffie) have endorsed the plan; with Associated Oil and The Texas Co. likely to join in any concrete action.

Relevant to the plan, Rush M. Blodget, general manager of the Agency, said:

"The responsibility of sponsoring thismovement could not, and cannot now be assumed, by the Agency without the wholehearted and cordial co-operation of all factors in the industry. The refiners and independent producers have been interviewed during the past several weeks, to ascertain their position in the matter, and to secure in advance assurance of their support. Many have already signified their approval of the plan, and the hope has been expressed that the industry may see its way clear to make the experiment.

"The man selected for the position would be in no sense a czar, but rather an arbiter or co-ordinator, an adjuster of difficulties now current in the industry. His opinions, with the facts before him, would command the respect of the public, concerned chiefly in the purchase of petroleum products; would be fair to men in the industry, and would secure the wholehearted co-operation of all factors concerned."

Octane Rating of Ethyl Gasoline Increased

By Telegraph

NEW YORK, Oct. 27.—The minimum anti-knock rating of Ethyl gasoline will be increased on March 1, 1932, from 74 to 78 Octane number, the Ethyl Gasoline Corp. announces.

In connection with the change the company has advised its licensees that the minimum tetraethyl lead content in a gallon of Ethyl gasoline will be increased from 0.75 to 0.9 cubic centimeters. The maximum lead content will remain at 3 cubic centimeters.

The list price of Ethyl fluid is to remain unchanged at 0.35 cent per cubic centimeter. The basic gallonage charge, however, will be reduced from 0.5 to 0.425 cent per U. S. gallon of gasoline treated.

This reduction in the gallonage or royalty charge is calculated to compensate for the higher minimum lead content in Ethyl gasoline.

Minor changes are to be made in the distillation range requirements of the base gasoline to be ethylized. These are in line with the new government specifications for 10, 50 and 90 per cent points.

THE EDITORS' VIEWPOINT

Why an Outsider for the Job?

By Warren C. Platt, Editor

AGAIN we have the annual rumor that the oil industry is about to have a "dictator," this time in the person of the Vice President of the United States. In the past the reports have dragged in Ex-President Coolidge, General Pershing, Justice Hughes and various lesser lights. As in these other cases, the proposed recipient of the honor denies the report.

One can't help but wonder if all this frantic effort to have an outside boss is not poor advertising of the oil industry; if it is not an admission of mental incompetence on the part of the oil men whose duty it is to run their own companies.

One also wonders if the average oil man would not resent an outsider coming in and telling him how to run his business. No matter how able that outsider might be in some respects, he would have great difficulty learning the oil industry, and some of those suggested as "dictators" may not appear to everyone to be the best fitted for the task proposed for them. One can't deny that we have some mighty able men at the heads of oil companies, men who have come up out of the ranks, have won their positions on merit alone, and hold those positions in these perilous times for that reason. We can name a dozen of them and more who appear to be far abler than any man yet suggested as a "dictator." Why then demote them?

A SIZEUP of the situation suggests that possibly the trouble is that we do not have enough man power today actively engaged in the task of co-ordinating the oil industry. In fact, we have one man less than a half dozen years ago when the industry was quite a bit smaller. When R. L. Welch, the first secretary and general counsel of the American Petroleum Institute, died some years ago, his work was substantially added to the then duties of W. R. Boyd, Jr., who had been Mr. Welch's assistant. Since that time the work of the Institute has grown quite materially and its problems have become more widely scattered and more complex. The result has been that E. B. Reeser, as president, has been giving more and more of his time from his regular job of running the Barnsdall Corp. to the affairs of the oil industry at large.

In these past few years we have had a few more new fields in the southwest and more refining and marketing problems and more contact with government and greater machinery within the industry for its operation. Howard Bennette, as managing director of the Western Petroleum Refiners Association, has been kept exceedingly busy at his tasks with others of a more national character added. With him in that territory is also Harry Smith, secretary of the Mid-Continent Oil & Gas Association, and W. N. Davis its president—also drafting time from his regular duties—and our proration problems have increased.

In California company officials lead by K. R. Kingsbury, president of the Standard Oil Co. of California, have given freely of their own time assisted by President Reeser of the Institute. In the east the duties of F. B. Dow, general counsel of the National Petroleum Association, have greatly increased with the introduction in that territory of measuring probable demand for crude oil and gasoline and co-ordinating supply to it.

THE industry today is facing its biggest and most complicated problem, that is its relation to government. The situation is coming to a head rapidly, both in the oil states and nationally. How the industry conducts itself in the next year or two and how it is directed by its leaders and these co-ordinating officers, will determine the degree of good or ill in our relation to government.

Instead of bringing in an outsider, totally unfamiliar with the important details of all that has been going on, unacquainted with how men feel and think, it would seem more logical and efficient to bring the men who have been doing the hard work a bit closer together and, if necessary, give them more help. Then, let the industry put in general charge a man of wide oil industry experience, tactful and yet forceful. He could be the president of the Institute on salary. The present encumbent, if he would accept, would be an ideal individual to start that plan off with.

We have these men who have been in training all these years. They have survived, in their jobs, the pitfalls and controversies of a most trying period, thus proving their abilities. The writer, from the sidelines as it were, has seen the thinking and talking and doing of the industry change radically the past ten years under the direction and education and moral suasion in which these men were the primary factors. The industry little realizes what it owes to these men and their steady persistent plugging away at men's minds to bring about a better realization of what is sound and fair and workable to industry and the public alike.

The industry might well consider giving more facilities and power to these men.

14 Points in Fighting Tax Evaders Given Four-State Jobbers

KANSAS CITY, Oct. 27

FOURTEEN points or measures, which our industry may employ in combating evasion of gasoline taxes by racketeers and bottleggers, were presented to the Big Four States Jobbers' convention here today by Frank V. Martinek, assistant vice-president of Standard Oil Co. of Indiana and chairman of the Gas Tax Evation Committee of Illinois. The 14 points are:

"1. .All legitimate marketers must be aroused to stand together in a solid front against evaders.

"2. State committees should be organized along lines indicated by the Illinois Gas Tax Evasion Committee, which has demonstrated by practical experience what can be done to curb evasion. These committees should have investigative units to assist in gathering fact information as to evasion.

"3. Public administrators must be apprised of the industry's sincere desire to correct this evil and be made to realize that the state is being defrauded of its revenue.

"4. Each state committee must study its motor fuel tax law and see whether it is sufficiently strong.

"5. The department charged with the responsibility of collecting the tax must be freed of political influence and operated on a business basis, with adequate and competent personnel.

"6. The railroads must be aroused to the importance of checking all shipments in order to prevent evasion.

"7. Publicity is one of the most important requirements, as public opinion is molded by the press. It is therefore necessary that the story be carried to the people by the press.

"8. Every shipper of gasoline must be required to report shipments to the state tax authorities. This means co-operation on the part of refiners, brokers, and distributors.

"9. A complete and current check of shipments against tax receipts must be carried out.

"10. All distributors must be required to obtain licenses and post bonds guaranteeing faithful and honest reports of gasoline handled.

"11. Marking of gasoline trucks to show clearly their owners or operators and source of their load must be required by law.

"12. Activities by state authorities must be supplemented by investigational work by the industry's own agents.

"13. The industry and various civic bodies interested in law enforcement must keep on the lookout for evidence of collusion between evaders and dishonest officials and must constantly stimulate vigorous action by the authorities in collecting the tax and prosecuting offenders.

"14. Finally, each state must have a provision in the law that any offender shall be deprived of his license, his bond shall be revoked, he shall be prosecuted under the law, and also his property shall be padlocked or even confiscated by the state, to cover taxes not paid."

Mr. Martinek announced the Illinois tax evasion committee would present to the American Petroleum Institute at its Chicago meeting Nov. 10 to 12 a mass of factual information which it had gathered in its work in metropolitan Chicago. Much of this information, he said, is being used in the prosecution of evasion cases in Illinois.

"It will be up to the institute to form a national organization to turn the spotlight of publicity on evasion and to co-operate with local organizations in uncovering evasion, in stopping it, and in punishing offenders," Mr. Martinek continued. "We must not wait for the institute and we must not leave the job to the institute alone. We, as marketers, must join hands and battle against evaders by every possible means."

Ten major means of evading taxes were given by Mr. Martinek. This list by no means covers the field, he said, but it includes the outstanding methods and can be used as a guide by oil marketers in helping state tax officials in detecting evaders

"1. Gasoline tax evaders transport gasoline across state lines, and on being questioned as to the disposition of gasoline billed to them, produce receipts showing distribution to the adjoining state. Lack of a check-up between states makes this practice possible.

"2. They set up paint factories or other industrial plants in order to show records of gasoline sold for tax free purposes when it is actually sold to the trade, and tax is collected.

"3. They fail to report gasoline received, or make false reports to the state authorities as to the actual quantity received.

"4. They operate under the names of dummy companies which receive and market motor fuel without reporting it for tax purposes. As investigation seems imminent these companies go out of business, but the actual business is carried on continu-

Oil Bootleggers Imitate Widely Known Brands

JUST as bootleggers have bottles and whiskey labels made to imitate well known brands of pre-Volsteadian and Scotch liquors, oil racketeers in Chicago are having cans lithographed in the colors and designs used by leading national motor oil manufacturers.

Frank V. Martinek, assistant vice-president, Standard Oil Co. of Indiana, told the Big Four States Jobbers' convention at Kansas City, Oct. 27 of this discovery of the Illinois Gas Tax Evasion Committee.

The cans which imitate the widely known brands are filled with inferior oils, he said, and sold to the public for genuine trade-marked oils. The bootleggers, however, are not cutting the price to the public.

ously by transferring it to new dummies.

"5. Where there is no tax on natural gasoline, naphtha, kerosine, and furnace oil, they purchase these products, blend them into a product which they sell to the public as motor fuel, and pocket the tax they collect from the public. Instances have been discovered in which such a product, colored with dye to the proper red has been sold as high-test, anti-knock fuel.

"6. They raise the gallonage figures shown on affidavits secured in connection with the tax-exempt sales, and pocket the tax on the difference between the amount actually sold to farmers and the amount reported sold in affidavits furnished to the authorities.

"7. They juggle shipments and reports; for example, by diverting a shipment billed to them to some other company, usually a very evanescent concern, which is no longer in existence by the time the tax authorities begin to hunt it in checking upon the shipment.

"8. They corrupt public officials by brides or by taking them into secret partnerships, induce them to sample improperly or deliberately to falsify their reports, and secure their protection against prosecution.

"9. They conspire with railroad employees and others to report shipments improperly.

"10. They conspire with unscrupulous refiners to receive shipments which have been improperly or incorrectly reported to the authorities."

W. H. Gray is Victim Of Pneumonia

TULSA, Oct. 24.—William H. Gray, veteran oil producer and attorney, died in a Tulsa hospital Oct. 22. Pneumonia was the immediate cause of his death, but he had been in poor health for several years.

Mr. Gray achieved national reputation as a campaigner for the independent producers and in 1921 organized the National Association of Independent Oil Producers. With a membership of several hundred producers, it was vigorous for several years, but latterly has consisted of little more than its founder.

Mr. Gray was born in Overton, Tex., 54 years ago. He obtained a law education in the University of Texas and became county attorney of Jefferson county, Tex. He entered the oil business in the Spindletop field, later spending several years in Mexico. Appearing as a friend of the court, he played a large part in the proceedings in 1905 which led to an order of Texas courts ousting the Standard Oil Co. from the state.

Mr. Gray was once married, but the marriage was terminated by divorce. He is survived by one sister. Burial was in San Antonio.

Thirteen Indicted in Chicago On Tax Evasion Charges

CHICAGO, Oct. 24

THIS has been a notable week-end in Chicago for tax evaders. Uncle Sam invited Mr. Alphonse Capone, the widely known beer baron, to be his house guest at Leavenworth, Kans., for 10 years and the social secretaries of the Cook County state's attorney, in the guise of a grand jury, set in motion plans for a party for 13 men to be guests at some later date of the state of Illinois. The 13 are charged wih conspiracy to evade the gasoline tax.

The 13 men, who were indicted 13 months ago on like charges but never brought to trial, are: Louis A. Weiss, Ben Pohn, Max M. Glasser, Maurice Pohn, William Pohn, Dan Levin, Elmer Berg, Jacob Franks, Poole Harrison, John F. Connor, C. Smuth O'Meara, Robert O'Meara and Maurice O'Meara. They are accused of bringing into Illinois more than 1500 carloads of gasoline between Aug. 1, 1929, the date the Illinois tax became effective, and June, 1930.

Weiss, Glasser, Levin, Berg, Franks and the Pohns are alleged to have operated as the Chicago Petroleum Co., A. & P. Oil Co., Fidelity Oil Co., and Empire Oil Co. This Empire company had no connections with the Cities Service subsidiary of that name.

Harrison and Connor operated the Reliable Oil Co. of Chicago. The O'Mearas operated as the Smythe Oil Co., Morris Petroleum Co., and Utilities Oils & Storage Co. Harrison also was part owner of the Knickerbocker Refining Co., which had a blending plant in Hammond, Ind. Harrison also operated th Dunes Oil Co., Rovella Oil Co. and Riverside Oil Co. in northwestern Indiana.

Harrison was arrested Oct. 22 after having been a fugitive for more than a year. He signed an immunity waiver and was taken before the Cook County grand jury immediately. One of the counts against him is that he shipped 415 carloads of gasoline from Fort Worth, Texas, presumably for Michigan but the gasoline was diverted to Illinois and did not pay the Illinois tax.

Harrison also is charged with paying $17,554 to Weiss to escape paying the tax. Weiss was acting as a volunteer employe of the state tax department.

It is charged an attempt was made to bribe W. F. Woolfall, a field auditor of the state tax department, to fail to report gasoline for taxation. When Woolfall refused to accept a bribe he was slugged and his brief case was stolen. Woolfall is now secretary of the Illinois code committee.

Books of the Knickerbocker company showed Harrison had turned over $20,000 to his Indiana representative which he said was to be used to "influence Indiana officials." After an investigation last year by James M. Ogden, attorney general of Indiana, Bruce Cooper, auditor of the Indiana motor fuel tax division, resigned.

The state's attorney's office here announced an effort would be made to have the indicted men tried at an early date.

Loose Terms Encourage Price Cutting, Say Credit Men

EXCELSIOR SPRINGS, Mo., Oct. 24

LOOSE credit terms on the part of the refiner encourage the jobber to give loose terms and the retailer passes them on to the public in the form of price cutting.

This was brought out in a report of the Committee on Terms and Discounts of the Petroleum Refiners Division, National Association of Credit Men, presented at the division's meeting here this week.

The report was presented by C. E. Votrian, of Barnsdall Refineries, Inc., Tulsa, chairman of the committee. It was based on replies to a questionnaire sent out by the committee.

Generally speaking the western group of credit men indicated a more conservative attitude on the terms and discounts than either the central states or eastern group. The westerners were unanimous in the opinion that cash discounts on gasoline should be eliminated. The eastern group showed a majority favoring elimination of cash discounts on the part of jobbers and retailers but not by refiners.

Those in central states answering the question favored cash discounts on gasoline by refiners, were almost evenly divided as to whether jobbers should grant such discounts but were overwhelmingly in favor of no cash discounts by retailers.

In all groups a majority stated that cash discounts should not be much larger than a reasonable interest rate on the money involved. Some took the position that, if discounts are reduced to a reasonable interest rate, collections will be slow while the larger discounts will cause buyers to get money at the bank to earn the discount.

Refiners and jobbers were two to one against granting special terms on petroleum products to farmers because of the seasonal nature of their incomes.

Greatest difference of opinion exists as to the time of payment which should be allowed on sales of petroleum products. Out of 41 replies to the questionnaire 25 were of the opinion that the time allowed for payment should be governed by the time necessary to resell or consume the goods. Out of 42 there were 37 of the opinion that terms allowed by the jobber to his customers should not influence the refiner in the terms he grants.

In the eastern states a majority favored taking sales margins into account in fixing terms. Central and western groups thought the margin of profit should not be considered. A majority of two to one were of the opinion that the quantity of goods sold should not influence net terms unless the quantity allowed the seller to move stocks for which there was not an immediate market, thus eliminating the accumulation of slow moving stocks in certain periods of the year.

On only one question were all groups unanimous. Everyone believed that loose refinery credits encourage loose jobber credits and tend to get the jobber into financial difficulties. The same holds true, they thought, in the relations between jobber and retailer.

A large majority in all groups expressed the belief that extended terms and large cash discounts result in price cutting on the part of retailers.

The committee presented a suggested code of ethics for credit men which stressed the duty of considering credit information exchanged as confidential and not to be used by competitors to gain business.

G. C. Goller of the Lubrite Refining Co., St. Louis, was elected chairman of the petroleum division. M. C. Roberts of the Tide Water Oil Sales Corp., Tulsa, was made vice-chairman. H. J. McLean of the Empire Oil & Refining Co., Tulsa, was re-elected finance officer.

Half Cent Rental on Leased Stations Adopted by Indiana Standard

CHICAGO, Oct. 26

PUTTING of rentals on leased drive-in stations by the Standard Oil Co. of Indiana, strictly on a gallonage basis, starting Oct. 15, is looked upon as a stabilizing factor in the gasoline retailing business in the middle west.

The company announced that, on all new business written throughout its extensive territory, rentals will be a half cent a gallon on gasoline sales for the month. When the lease and agency form of contract between oil companies and individual service station owners was first adopted some years ago, it was general practice to offer a flat sum as rental for the station properties. The amount of the rental was determined by the bargaining ability of the station owner and the estimate of the oil company salesman as to the amount of gallonage the station might do under the new arrangement.

The trend lately has been toward putting the rental on a gallonage basis, the amount varying, some companies offering as much as a cent a gallon in times past. This amount of rental has been reduced, however, and it is likely that the majority of oil companies using this form of contract will follow the Standard's example and make it a half cent uniformly.

All mid-western companies are now basing rentals on volume rather than a flat figure, according to an oil company executive.

Standard of Indiana had been basing rentals for leased stations in Chicago on a half cent a gallon. In the remainder of its territory flat rentals were made.

Petroleum Rates Badly Muddled By Latest I.C.C. Decision

By A. E. Heiss

N. P. N. WASHINGTON REPRESENTATIVE

WASHINGTON, Oct. 26 CONFUSION is the indicated result on oil rates of the decision of the Interstate Commerce Commission on the request of the railroads for a 15 per cent increase in all freight rates. Nobody at this time can give an intelligent guess as to the outcome.

Nominally the decision, estimated to increase the revenue of the railroads from $100,000,000 to $125,000,000 a year, allows the railroads to impose an increase of $6 a car on crude petroleum and one cent a hundred pounds on refined products.

If carried out the one cent permission would have the effect in some parts of the country, of putting an increase of $7.40 on a 10,000-gallon car of fuel, road, or residual oil, while the increase on a carload of gasoline would be only $6.60, the estimated weight on the fuel, road, and residual oils being 7.4 pounds a gallon while the estimated weight on refined products is only 6.6 a gallon.

At present crude and road fuel, and residual oils are on the same rate basis while the refined products are on a higher level. West of the Mississippi, generally, rates on the heavy crude and low value products are generally 80 per cent of those on refined products.

The decision contains a proviso to the effect that these $6 a car and one cent a hundred pound increases may be maintained only until the rates prescribed in the two big Hoch-Smith petroleum cases are made effective. These are technically known as No. 17000, parts 4 and 4A. At present the order requires the Hoch-Smith to be made effective not later than Dec. 3.

The Hoch-Smith cases, according to the views of railroad and oil traffic men, threw the petroleum rate structure into a cock-eyed condition by undertaking to put petroleum rates on a higher level, in all parts of the country, relatively speaking, than the level of rates from the Mid-Continent groups to Kansas City, St. Louis and Chicago and beyond those key points.

Broadly speaking all petroleum rates, other than those from the Mid-Continent to the northward and as far east as Chicago and within the mountain-Pacific territory were revised in the two Hoch-Smith cases. Generally the revisions were upward, on the theory that petroleum and its products could stand higher charges, which, if imposed would make it possible for the regulating body to make lower rates on products of agriculture, including livestock. Lower rates for the farmers was the intention of the Hoch-Smith resolution, adopted by Congress in 1925.

The investigation of oil rates was begun in 1928 when everything was booming and the decisions in No. 17000, parts 4 and 4A were made on the record then gathered but were put forth when the world-wide economic distress was showing its worst effects.

If the schemes of the regulating body can be worked, about which the gravest doubt exists among traffic men, after Dec. 3 oil rates within the mountain-Pacific territory and from the Mid-Continent groups to western trunk line territory including Chicago, will stand increased by $6 a car and one cent a hundred pounds on products, both high and low value, while the other parts of the country will have Hoch-Smith rates.

The matter is put in the potential form because before the railroads can have any of the increases they must meet what the railroad executives believe to be an impossible condition. They must put before the regulating body a plan acceptable to it under which they will pool the increased revenue resulting from the higher rates so that financially lame railroads may be given enough from the pool to enable them to pay the interest on their bonds and thereby generally maintain railroad credit. The executives don't like that idea of setting up a dole for the weak roads.

Banks and insurance companies made the 15 per cent case for the railroads. Traffic vice-presidents and traffic managers were elbowed aside. They had been making thousands of reductions in the last two years to meet competition and the situation created by the fall in commodity prices and were not in good position to say that they believed they could get more money by increasing rates instead of, as they had been doing, reducing them.

On account of that condition it is considered extremely doubtful whether the permission to increase the rates $6 a car on crude and one cent a hundred pounds will be in effect more than a few weeks if they ever are put into operation in the parts of the country where rates were prescribed in the Hoch-Smith cases.

In view of the difficulties if not impossibilities created by the two provisos mentioned, pooling and observing the Hoch-Smith rates as maxima, there is a strong impression amounting almost to a conviction, that the decision in the 15 per cent case, will have only a minimum of meaning to the petroleum industry.

Railroads Abandon Fight On Oil Pipelines

By Telegraph

WASHINGTON, Oct. 26.—The Association of Railway Executives has dropped its campaign to divorce the oil industry from its pipelines. This action was taken at a meeting at Atlantic City last week.

The railroad executives endorsed all of its "declaration of policy" adopted a year ago except that part dealing with pipelines. It directed the preparation of legislation which would permit the carriers to enter into all forms of transportation on terms of equality and reiterated its request for regulation of motor vehicles and water lines.

Demand for Oklahoma Crude Set At 565,000 Barrels Daily

By Telegraph

OKLAHOMA CITY, Oct. 26

EVIDENCE developed Monday at the Corporation Commission hearing indicated a probable crude demand in Oklahoma during November and December of 565,000 barrels daily. This total was arrived at by taking testimony of crude purchasers. Belief is that the commission will scale down this figure in its order to conform with the total of 546,000 barrels agreed to by Kansas, Oklahoma and Texas in September.

President R. M. Young of the Carter Oil Co. expressed the opinion that the latter figure is too high and would result in storage of crude. His opinion is that 525,000 barrels daily in November and 500,000 in December would about balance actual demand. His information is that the present allowable of about 490,000 barrels is causing a draft of 35,000 to 40,000 barrels daily on stocks.

Indications were given by Commissioner Hughes that something of a fight in the commission will occur before any order is issued. He said he wanted to know whether oil production is under martial or civil law, and if the former he thought the commission should take no action. The commission is a constitutional body and is authorized to have jurisdiction in oil matters and if set aside by the military he saw no point in the commision issuing an order.

Nominations for Oklahoma City field purchases over the next 60 days were around 200,000 barrels. Largest nominations were Sinclair Oil & Gas Co., 43,500 barrels daily; Carter Oil Co., 15,000; Continental Oil Co., 18,500; Empire Oil & Refining Co., 35,000; Stanolind Crude Oil Purchasing Co., 45,000, and the Shell Petroleum Corp., 12,000. The Texas Co. offers to take 5000 barrels and its subsidiary the Indian Refining Co., wants 7000 barrels per day.

The total for the state as given is based on the assumption that the Seminole district will be permitted to proceed on a 50 per cent allowable production as in the past and that the potential to be taken will conform to the estimate of Umpire Collins of 310,000 barrels.

Many knotty questions remain for settlement including the question of prorating Oklahoma City by its separate sands on different percentages which question is once more up for consideration. Another is whether the commission will include in its order the recommendations Cicero Murray will make before the hearing ends on methods of equipping Oklahoma City wells. The situation now is that the next few days will be a period of trouble with the commission disposed to challenge continued enforcement of proration by troops.

Producers Fight Murray's Tax Program

TULSA, Oct. 24.—Decision to battle vigorously against all seven of the initiated bills and constitutional amendments which Gov. Murray will present to the voters this year was unanimously reached Oct. 20 by the Kansas-Oklahoma division of the Mid-Continent Oil & Gas Association. It held its annual meeting in Tulsa.

Of especial concern to the oil industry is the proposed income tax law, which would impose a maximum of 10 per cent on net earnings of corporations and individuals. This rate would apply on $100,000 and more and there is no doubt that it would drive many companies out of the state.

The division voted to oppose the entire Murray program on the ground that to separate its interests from those of the other people of the state would weaken the campaign of opposition. As the week closed conferences were being held with leaders of other industries, business men and bankers, and it is expected that a central committee will be established in Oklahoma City to direct the campaign.

Alvin Richards was re-elected president of the division, as were all other officers. These are: Rush Greenslade, Gypsy Oil Co., first vice-president; T. C. Johnson, Wichita, vice-president for Kansas; John H. Kane Phillips Petroleum Co., vice-president for northern Oklahoma; Wirt Franklin, Oklahoma City, vice-president for southern Oklahoma and Harry H. Smith, secretary-treasurer.

The following new members of the large executive committee were elected: James Davis, Hazlett, Davis, Bradford & Frazier, Wichita; Harry Diamond Hollenville, Okla.; J. H. Gardner, Tulsa; A. M. Gee, Tulsa; John B. Grieves, Terlton, Okla.; E. A. Haines, Alva, Okla.; Carl Haun, Blackwell, Okla.; S. J. Hernstadt, Ardmore; J. E. Holm, Tulsa; S. W. Howland, Ardmore; A. B. Imel, Cushing; Baird H. Markham, Ponca City; R. Otis McClintock, Tulsa; H. J. Morlang, Tulsa; Henry L. Phillips, Tulsa; Ralph Pryor, Wichita; Ralph B. Roark, Tulsa; J. L. Shakely, Tulsa; Clay Tallman, Tulsa; K. Winship, Tulsa; C. H. Wright, Tulsa and R. M. Young, Tulsa.

Resolutions of regret at the loss by death of three prominent members of the association were adopted. Those named were Henry MCGraw, Gypsy Oil Co.; Eugene B. Lawson, independent operator, and F. A. Pielsticker, Skelly Oil Co. All died since the 1930 annual meeting.

Howard Buys Settled Wells

TULSA—Gypsy Oil Co. has sold to Oscar R. Howard its settled producing properties located in Secs. 4, 7, 8, 18, 17 and 20, Twp. 18N., R. 13E., Tulsa county. This is east of the town of Jenks. There are 88 wells involved in the sale, producing 95 barrels daily, net. Mr. Howard has a gasoline plant in the vicinity and has been purchasing the casinghead gas from these wells.

Acreage Proration Plan Proposed To Check East Texas Drilling

By Telegraph
DALLAS, Oct. 27

PRORATION of the East Texas oil field on the acreage basis, which would serve to penalize the extensive drilling of new wells, is proposed in a plan adopted at a meeting here today of the Texas Oil and Gas Conservation Association. Eighty companies and individuals operating in the field, represented at the meeting, including practically all the larger companies, approved the plan.

Allowable production of 4 barrels per acre is provided or something under 400,000 barrels daily average output for the field, all told, there being estimated 92,000 acres actual and potential producing acres in the area.

On the basis of 4 barrels to the acre, one well to 20 acres, the present basis for drilling in the field, would be allowed only 80 barrels per day, hardly enough to warrant drilling. A well to 40 acres would be allowed only 160 barrels per day. Such a proration program would likely serve to check drilling almost entirely in the field, once the present drilling wells are completed.

The extent to which drilling there has increased under the present basis of so much allowable production per day per well is seen in the fact that the total number of producing wells Sept. 1 was under 1000. Oct. 26 it was 2617 wells.

A committee was named to draft the proposed plan into suitable resolutions to put before such state authorities as it may think necessary, the thought being that Gov. Sterling might see fit to adopt this plan in his proration program enforced under military law, at present on the basis of 165 barrels per well per day.

The meeting today, presided over by E. T. Moore, president of the Simms Oil Co., adopted a resolution to present to the Texas Railroad Commission, suggesting that it appoint a group of engineers to make a survey and determine the actual acreage in the East Texas area, which should be included in an acreage proration program. Until then the figure of 92,000 acres would be used.

Since the legal limitation is one well to 20 acres in East Texas, the proration plan adopted today would call for the production on a 20-acre tract, presumably with one well, of 80 barrels per day. Smaller districts would be allowed the same output as a 20-acre tract. The plan stipulates, however, that no division of property after Sept. 15 would be recognized.

The plan also provides that no individual lease in the field is to exceed 100 acres. There are a few such leases in the field, and they are to be treated on the same terms, in each case, as a 100-acre lease, that is with an allowable production of 400 barrels per day.

J. Edgar Pew, Sun Oil Co., at the meeting today said that he had discussed the proposed plan with H. F. Sinclair, head of the Sinclair Oil & Gas interests, and that the latter had strongly approved the plan. Mr. Sinclair had previously publicly stated he would favor a plan which reduced the amount of drilling in the field. W. B. Hamilton, another speaker, said he had sounded out the Gulf Oil and Humble Oil & Refining interests and that they approved the plan.

A committee of seven was named by the meeting today to present the plan to the proper state authorities. It includes Charles Roeser, independent operator, provisional president of the Texas Oil & Gas Conservation Association, which was formed about three months ago; Beman Strong, head of the Yount Lee Oil Co.; Col. J. Lewis Thompson, Kilgore, president of the East Texas Land Owners Association; J. R. Pearson, independent operator; J. Edgar Pew, vice president, Sun Oil Co.; H. L. Hunt, largest independent operator in East Texas; T. J. Donoghue, of The Texas Co.

By Telegraph
FORT WORTH, Oct. 27.—General Wolters today announced that the allowable production of East Texas wells would be reduced to 150 barrels effective Oct. 29. This is a reduction of 15 barrels per well. The move was an executive action by Governor Sterling.

East Texas production Oct. 26 was 428,310 barrels from 2617 wells.

Troops Needed to Preserve Order, Sterling Tells Court

DALLAS, Oct. 24

THAT disorder and destruction of property in East Texas is likely to result if military rule there is lifted has been presented to a federal court by Gov. Sterling and his military chief, Brig. Gen. Jacob F. Wolters, as the chief reason for continuing to keep troops in that area.

The federal court at Beaumont, Oct. 13, issued an injunction on behalf of the Brock-Lee Oil Co., producers in East Texas, allowing them to set aside in their operations the order of the Texas Railroad Commission establishing 165 barrels a day per well maximum production.

Gov. Sterling showed the firmness of his intention to keep control of the situation by at once issuing a military proclamation embodying the 165-barrels per well order, putting it promptly in the hands of Gen. Wolters, in command of troops in the field, and enforcing it on the Brock-Lee company by means of troops on the derrick floor. Gov. Sterling declared that no court short of the United States Supreme Court could

assert jurisdiction over the chief executive of the state.

Oct. 22, Judge Randolph Bryant, of federal district court at Beaumont, who granted the injunction, issued an order citing Gen. Wolters to appear and show why he was not guilty of contempt of court for failing to obey the court's injunction. The general filed a lengthy answer, expressed profound respect for the court, asserted he was acting under instructions from his commander-in-chief, the governor, and said there was danger of much trouble if East Texas wells are permitted to produce to capacity. He said:

"Respondent is in receipt of information from sources believed by him to be credible and from persons too numerous to mention, and from all parts of the military district, that, if the production of oil in said district should again be opened wide, as it was until the declaration of military law, the acts above set out (destruction of property) would be committed by the land and royalty owners and the operators of oil producing property within said district, and this respondent was fully aware that, in such attempts, they would be instantly and violently aided and abetted by such members of lawless and anti-social organizations as might be present in the locality."

Gen. Wolters attached to his answer to the court an affidavit from Gov. Sterling in which the governor assumed full responsibility for the military occupation of the East Texas oil fields.

The governor quoted from his military proclamation of Aug. 16 calling upon the state troops to enter East Texas, in which he said: " . . . a state of insurrection, tumult, riot and breach of peace existed in the counties of Gregg, Upshur, Rusk and Smith . . ."

The governor's affidavit recounted his conversation with Gen. Wolters Oct. 13, when the court's injunction was issued as follows:

"Further, he (Gen. Wolters) told me that he was informed and believed that, if any well or wells in the military district should be permitted to produce more than 165 barrels of oil per day, the land and royalty owners, together with operators of oil producing properties, and citizens generally, would attempt to shut down said well or wells by physical force, which would inevitably entail the destruction of property and direct peril to human life. He requested that 10 additional Texas rangers, including Capt. Tom Hickman, be dispatched immediately to his headquarters. . . ."

" . . . . Believing that the protection of the property and persons of Texas citizens imperatively demanded such action on my part, I . . . . ordered Gen. Wolters, as the officer enforcing martial law in the military district composed of Gregg, Upshur, Rusk and Smith, not to permit any well in the military district to produce more than 165 barrels of oil per day and immediately to shut down any well or wells in said district producing in excess of that amount."

Speaking at a hearing before the state railroad commission in Austin Oct. 16, Gen. Wolters had said:

"The talk is more or less openly made that, if the wells cannot be held down by the state of Texas, they will be shut in by citizens; and if this cannot be done by reason of guards around them, the pipelines and storage tanks will be blown up so that there will be no place to put the oil and, therefore, by that means, bring a shut-down."

Upon receipt of Gen. Wolters' answer to the order to appear before the court, the federal judge is quoted as saying that nothing further would be done in the matter until the three-judge court hears the Brock-Lee case at Beaumont Oct. 29. Possibility that some importance will be attached by the plaintiff Brock-Lee interests to the recently signed agreements of Texas, Oklahoma and Texas state agencies to hold production within certain specific limits, is seen through the fact the plaintiff's attorneys have taken the deposition of C. V. Terrell, chairman of the Texas Railroad Commission. Deposition of R. D. Parker, chief supervisor of the commission's oil and gas division, also was taken.

It is now learned that Gov. Sterling contemplates issuance of an executive order placing a top limit of 400,000 barrels daily production on the East Texas district, leaving it to his military forces to adjust the allowable production per individual well as often as may be required to keep total output within that limit.

Under the present 165-barrel-per-well allowable, reduced from 225 barrels early in September, East Texas production for the week ended Oct. 21 is estimated at 401,173 barrels daily average. The week before it was 391,408 barrels. Present output is coming from 2508 wells, as compared with 2423 wells the week before.

Total movement of crude from the East Texas district for the week ended Oct. 21 is given as 412,298 barrels daily average, of which only 3893 barrels moved by tank car. The larger interests continue to take all available crude, local refineries securing only 16,481 barrels, about 1000 barrels less than the week before.

Who Takes East Texas Oil

FOLLOWING is movement of East Texas crude for the week ending Oct. 21 by principal interests, aside from about 4000 barrels moving by tankcar and 16,481 barrels, taken by local refiners.

Company	Barrels Daily
Arkansas Fuel	22,324
Atlantic Oil	12,388
Atlas Pipe Line	4,315
Gulf Oil	32,685
Humble Oil & Rfg.	95,214
Magnolia Petroleum	69,789
Shell Oil Co.	17,010
Sinclair Oil & Gas.	33,630
Sun Oil Co.	42,801
The Texas Co.	30,587
Texas-Empire	20,453
Tidal Oil Co.	6,159

Gasoline Line Under Construction

NEW YORK, Oct. 26.—Completion of the new 6-inch gasoline pipeline being laid by the Standard Oil Co. of New York from Providence, R. I., to Springfield and Worcester, Mass., is expected by Jan. 1. The line now is under construction. Standard of New York has a refinery at Providence and extensive distribution in the Springfield-Worcester area.

Sees Menace in Rising Refinery Operations

NEW YORK, Oct. 26.—Increase of 44,613 barrels daily in August refinery runs is regarded as "An Untimely Recovery" in an article in the October issue of *The Lamp,* organ of the Standard Oil Co. of New Jersey.

The article recounts the beneficial results obtained in the late months of 1930 and the first eight months of 1931 in reducing gasoline inventories. The increase in gasoline output in August of 2.9 per cent shows a tendency which seriously threatens the hope of a much needed overall draft on U. S. gasoline stocks in 1931, the article says:

"In the light of the fact that domestic gasoline consumption has been gaining at a rate of only, 2.4 per cent this year while total consumption included exports has run behind that for 1930, the decision on the part of refiners that there is a call for increased activity is not easy to understand. The industry should end the current year with at least as much of a reduction in gasoline stocks as it showed in 1930," the article concludes.

Prairie Superintendent Dies

AMARILLO—Asa B. Alspach, superintendent of production for the Prairie Oil & Gas Co., at Borger, died Oct. 22 of a malady the nature of which physicians had not definitely determined. The same thing had previously caused the death of his wife. Diagnosis was that it was some rare form of food poisoning. Mr. Alspach was 60 years old and had been in the Panhandle for four years.

Standard of Indiana Builds New Type Cracking Plant at Casper

CLEVELAND, Oct. 26

CONSTRUCTION of a 6500-barrel per day cracking unit at the Casper, Wyo., refinery of the Standard Oil Co. of Indiana has been announced by that company. Work will begin very soon. Contract for the construction has been awarded to the M. W. Kellogg Co. of New York, it is stated.

It appears that this action is the result probably of two conditions. Modernization of the Standard plants to keep abreast of newer developments in refining in general and in gasoline production in particular is important just now. The recent placing on the market of the new Standard Red Crown grade of gasoline with increased anti-knock and volatility specifications has made it necessary or at least desirable that older obsolescent or obsolete equipment now in use in the plants of the Standard and its subsidiaries be replaced immediately by more modern units in order to produce the new fuel economically.

The new unit replaces old equipment of the Burton and other types which have been in use at the Casper plant. The latter will be scrapped, it is understood as it is retired from operation. No details are obtainable at present as to the specific design of the new cracking process or its operation, company officials expressing themselves as being unwilling to talk details until the plant is placed on a routine basis of operation.

It is understood that the main part of the work of its development was carried out at the Standard refinery at Whiting, and that the work has been continued in collaboration with the Gasoline Products Co. and the Kellogg Co. The new process is a type of "composite" cracking method, based on the most recent findings in cracking technique for the production of high anti-knock, stable gasoline, it is said. Fractionating towers will be operated as an integral part of the unit, it is understood.

The preparations for beginning the construction work have been speeded up in order to provide as far as possible employment for a large portion of the unemployed population of Casper during the coming winter. Stipulations in the contract call for employment of local labor to the greatest extent possible, and preference is to be given to Standard employes temporarily out of work. It is expected that the erection will require eight or nine months, and that the unit will be in operation by early next summer, according to present plans.

American Firms Building More Foreign Units

CLEVELAND, Oct. 26.—Contract for the installation of a second Dubbs cracking unit by the Distillazione Italiana Combustibili, S. A., of Venice, Italy, at its refinery at Porto Marghera, has been authorized by that company. The first cracking unit of this process has been in operation for some months.

Erection of the new unit will be begun immediately, it is understood, and it is expected to be in operation early in 1932. Distillate from this unit will be re-run in a pipe still unit now in process of rebuilding, by Arthur G. McKe Co. of Cleveland, which is adding a new furnace to an older installation, equipping it with automatic control, and other modern improvements. The new cracking plant will be the largest in Europe, it is said.

McKee Co. has also just completed a continuous treating unit at the refinery of Societe Anonyme Benzina Italiana, at Naples, where last year the same firm built a pressure distillate re-run unit.

California Standard Withdraws From Frosted Foods, Inc.

LOS ANGELES, Oct. 23

RUMORS that the Standard Oil Co. of California was going into the business of distribution of frozen food products have been definitely laid at rest through its official announcement it has reached an agreement with the General Foods Corp. whereby the latter will have complete charge of the production and distribution of Birdseye Quick Frozen Food Products.

The Standard had maintained that the sale of food products, frozen or otherwise, through its distributing facilities was never seriously considered; that its purpose in entering into the arrangement with the General Food Corp. was to allow it to act as a co-ordinating unit in making the Birdseye process available to the western perishable foods industry. Said the Standard:

"Food distribution is not within the sphere of Standard Oil Co.'s or Pacific Public Service (subsidiary) Co.'s activities. Because General Food Corp. is peculiarly equipped for the production and distribution problems involved, it has been mutually agreed that General Foods Corp. should proceed without the Standard Oil Co.

"Standard Oil Co. of California has not altered its opinion with respect to the merits of the process and does not relinquish its participation because of any lack of confidence in the ultimate success of its development."

The company stated that a study of the western situation—Rocky Mountain and Pacific Coast states, Hawaiian Islands, Alaska and the West Coast of Mexico—convinced it that the development of this territory under the Birdseye patents could best be accomplished through production and distribution, rather than by licensing. This presented a situation, it said, different from that which first attracted its interest.

Last April the Standard announced the pending formation of Pacific Frosted Foods Inc., for the commercial development of the Birdseye patents, under the joint direction of the General Foods Corp. and the Standard, which was interested because of the activity in refrigeration projects of its subsidiary Pacific Public Service Co. Operation of producing properties in the Kettleman Hills field with an abundance of high pressure gas then caused the Standard and other oil companies to consider enterprises to utilize the inherent energy of this gas. One such possible use was in making dry ice. Conditions with respect to gas supply later changed, with the development of production from deeper sands, with lower gas-oil ratio, and the shutting in of wells of high gas pressure in the higher oil sands.

The Birdseye patents cover processes for the packaging and preservation of foodstuffs by rapid refrigeration. The practically instantaneous freezing under pressure allows the formation of ice crystals so minute that there is no rupture of cells and the food treated retains its original food value, flavor and texture.

Hearing Set for New York Tank Monopoly Case

NEW YORK, Oct. 24.—Hearing has been set for Nov. 6 in the appellate division of the Supreme Court of New York on the appeal of the Davis Welding & Mfg. Co., of Cincinnati, in itseffort to have New York authorities open the market for truck tanks to be used in that city to competing manufacturers. At present the New York city specifications permit only the sale of a siphon type tank, which is patented.

It is the contention of the Davis company that specification of a patented article violates a New York city ordinance governing public purchases. The Davis company brought suit in June against J. J. Dorman, fire commissioner of New York, asking for an injunction to prevent specification of a patented device on tanks approved for use in New York. A motion for the injunction was denied.

Patent No. 1,696,954 on the Hayes siphon is involved. It is controlled by the Columbian Steel Tank Co. of Kansas City. The patent was sustained in an infringement action which the Columbian company brought against the Scott Welded Product, Inc., of Long Island City, formerly Smith, Hamburg & Scott Welding Co. The Scott company tried to appeal the decision of the U. S. district court but the U. S. circuit court of appeals refused to hear an appeal.

The New York tank monopoly case will be laid before the directors of the American Petroleum Institute in Chicago Nov. 10 in an effort to have the institute intervene in the Davis action in New York either in the present appeal if the hearing is postponed from Nov. 6, or in an appeal to another court.

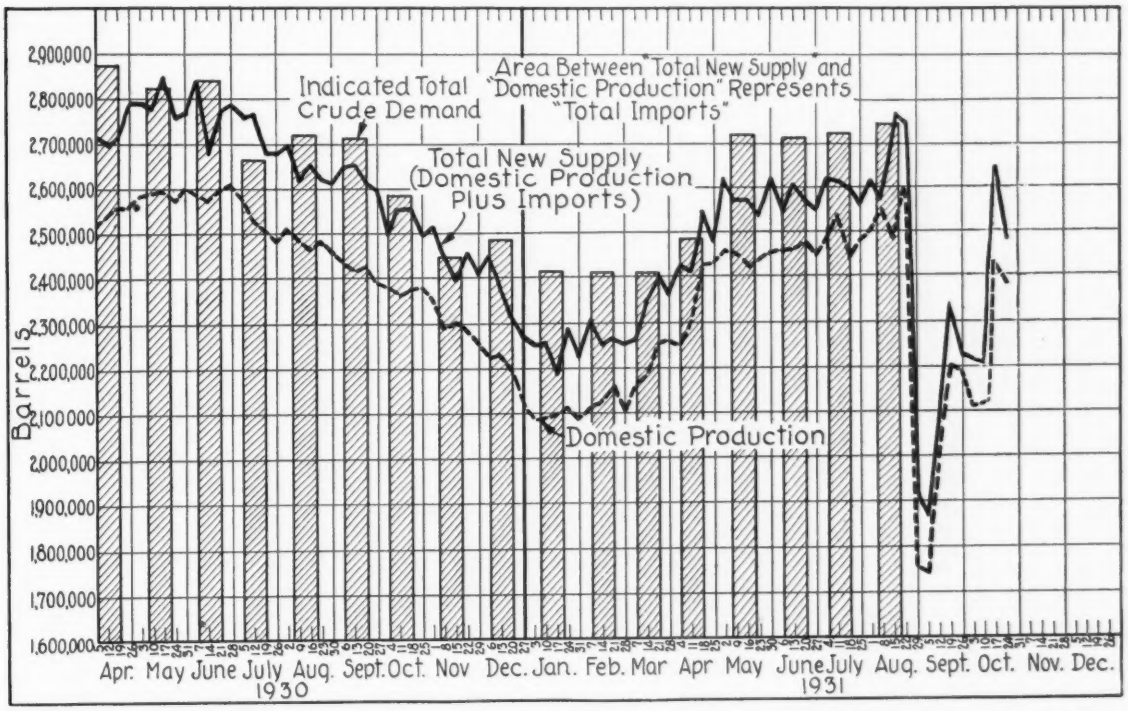
It is the opinion of Augustine Davis Jr., president of the Davis company, that the monopoly in New York is getting stronger rather than weaker and its effects may become far-reaching. It is known that politicians from other cities looked into the possibilities of the New York situation in 1928 but so far similar specifications have not been adopted elsewhere.

Mr. Davis has also laid the case before the Hofstadter committee of the New York legislature, which is investigating affairs of New York city. The Davis fight to gain recognition for more than one tank in New York has lasted more than six years.

Metal Hose Adds to Sales Staff

NEW YORK—Metal Hose & Tubing Co., Brooklyn, has appointed as sales manager William A. Kilmartin, previously manager of its Pacific Coast branches. He is now visiting oil companies. For its export department Frank A. Bedingfield, with several years' experience in export trade, has been engaged to conduct export sales from the Brooklyn factory.

Review of Late Production News



This chart shows crude oil supply according to the American Petroleum Institute reports (solid line) in relation to indicated crude oil demand as taken from the Bureau of Mines monthly reports (shaded columns).

DOMESTIC crude production dropped 55,750 barrels daily average to 2,381,250 barrels per day in the week ended Oct. 24 according to American Petroleum Institute estimates.

Imports were more than cut in half dropping to 100,000 barrels per day. Total new supply thus was reduced 165,465 barrels per day to 2,481,250 barrels.

Oklahoma City production fell 22,500 barrels daily average in the second week the field was open. East Texas production was in one of its temporary sags in the week ended Oct. 21 due to lowering well allowables, output being off 21,850 barrels to 400,300 barrels per day.

California

UNIT operation of the new deep zone in the Elwood district tapped by the Barnsdall-Rio Grande Luton Bell No. 14 has been proposed as a means of preventing rapid development of the Sespe formation.

In the Los Angeles Basin, Shell Oil Co. and Union Oil Co. are deepening shallow producers in the Dominguez field to horizons that have remained practically untouched under terms of a gentlemen's agreement. Union recently completed its Carson No. 4 in this area for approximately 2000 barrels of oil and half a million cubic feet of wet gas. Shell is drilling two wells on its Reyes lease to offset the Union completion.

Mid-Continent

OKLAHOMA'S chief producing interest at this time is one of deciding how much oil is to be taken from pools already developed. Wildcatting activities have declined to the point where there are not a half dozen tests under way that are considered by operators to be worth watching.

The deep test in the Cement field of Caddo county, Okla., referred to two weeks ago as shut down at 10,079½ feet, is now setting six and five-eights inch pipe and after cementing the well will be drilled deeper. This is the deepest hole ever drilled in the United States and the pipe now being run—9777 feet of it—constitutes the longest string of six-inch ever to be run in a hole.

While the test is still an important one, its depth discounts a large area for drilling to the Wilcox and other horizons that yield large production elsewhere, so long as oil is plentiful at much shallower depths in other areas.

Daily Average Production Important Districts, American Petroleum Institute Figures

(By Telegraph)

	Week Ended Oct. 24 Barrels	Oct. 17 Barrels
Okla. City	143,150	165,650
Oklahoma	482,500	505,600
East Texas	400,300	422,150
Total Texas	979,750	1,010,700
California	508,100	507,400
East of Rockies	1,873,150	1,929,600
Total U. S.	2,381,250	2,437,000

Kansas

IN KANSAS the outstanding development of the week was the showing in a Barton county wildcat. Hilligoss and others test in the SW SE NE of 12-20S-11W, three miles northwest of the Raymond, or Schurr pool, was standing at 3314 feet with 2000 feet of oil in the hole. At that depth it was one foot in the Siliceous lime, productive in the

Raymond pool and in other isolated wells north of the latter pool. As this territory is inadequately served by pipelines, it is not believed that the showing will start a drilling campaign.

Texas

NO LET-UP in drilling is evidenced in East Texas, 129 new locations having been made the past week.

Chief extension of producing fields in Texas was one of a half mile to the southwest of the Pettus field, Bee county. Buchanan & Lefevre drilled their No. 1 Ray into pay at 3887 feet, continuing to total depth of 3908 feet. It is estimated to be good for 750 to 1000 barrels daily.

Mississippi

CONSIDERABLE interest is shown in the wildcat of the Gulf Production Co. in 10-2N-16E, Clarke county, Miss. This is just over the line from Alabama.

The well was cored from 3673 to 3700 feet and the last eight feet was a green, glauconitic formation heavily saturated with brown oil. At the end of the week a string of six and five-eighths inch casing was being set at 3685 feet and the showing will be tested.

The formation which carries the oil is identified as the Eutaw, which corresponds closely to the Blossom sand, productive in Arkansas and Louisiana. The possibility is seen that the Tuscaloosa formation, corresponding to the Woodbine which yields the oil in the East Texas field and in other large pools, may be found productive here.

The test is thought to be on an extension of the structure mapped in Alabama as the Hatchetigbee anticline. It is adjacent to a fault located by the Gulf company by core-drilling.

The venture is not related to the previous tests that have been drilled in Mississippi, being a considerable distance from the Jackson gas area. The same company drilled a test in the area previously and the present well, No. 1 on the Long-Bell Lumber Co. land, is reported to be 172 feet higher structurally than the previous one, which was more than a mile away.

Gulf has a sizeable block of acreage in this area and the test is about two miles from the edge of that block.

Unitization Suggested as New Deep Sand is Found in Elwood

LOS ANGELES, Oct. 23

UNITIZATION of the new deep sand in the Elwood field has been suggested, since the Barnsdall-Rio Grande interests proved the Sespe formation as a prolific producer of light crude. The new horizon lies about 1000 feet below the Vaqueros and opens a large area to new development.

E. B. Reeser, president of the Barnsdall Oil Co., is reported favoring a plan of unit operation for development of the new sand and has notified Pacific Coast conservationists that his company will agree to shut in the discovery well if other operators in the field will suspend preparations to drill to the lower horizon.

Pacific Western Oil Co. has posted notice to drill two wells on the state tideland permit No. 92, which is offset on the land end by the new discovery well. It is also reported that two Barnsdall-Rio Grande wells and one Bankline Oil Co. well are being deepened.

The deep discovery Luton-Bell 14, is bottomed at 4385 feet, less than 100 feet in the sand with 8 and 5/8-inch casing cemented at 4325 feet. On a 24-hour gauge it gauged 2500 barrels of 42 gravity oil and 2,000,000 cubic feet of wet gas with a gasoline content of about three gallons per 1000 cubic feet. This production was through a 50/64-inch bean, with casing and tubing pressures 1000 and 400 pounds, respectively. Every indication is that the well could establish a flow rate in excess of 5000 barrels if opened up.

Acknowledged to be on the flank of the Elwood structure, it was originally completed in the Vaqueros formation at 3627 feet in January, 1929, for an initial of 3300 barrels of 38 gravity oil. After having produced nearly 400,000 barrels from this upper sand in two years, it was killed preparatory to deepening.

Since discovery by the Barnsdall-Rio Grande interests in 1928, the Elwood pool, with a maximum of 46 producing wells at any one time, has yielded over 32,500,000 barrels of oil ranging from 35 to 38 gravity. Including the mainland and tideland portions of the field, approximately 350 acres is considered proven. More than 60 wells have been drilled, many entirely shut in under the proration program. With 35 wells the Barnsdall-Rio Grande combination produced over 20,000,000 barrels of oil. Only two dry holes have been drilled in the field.

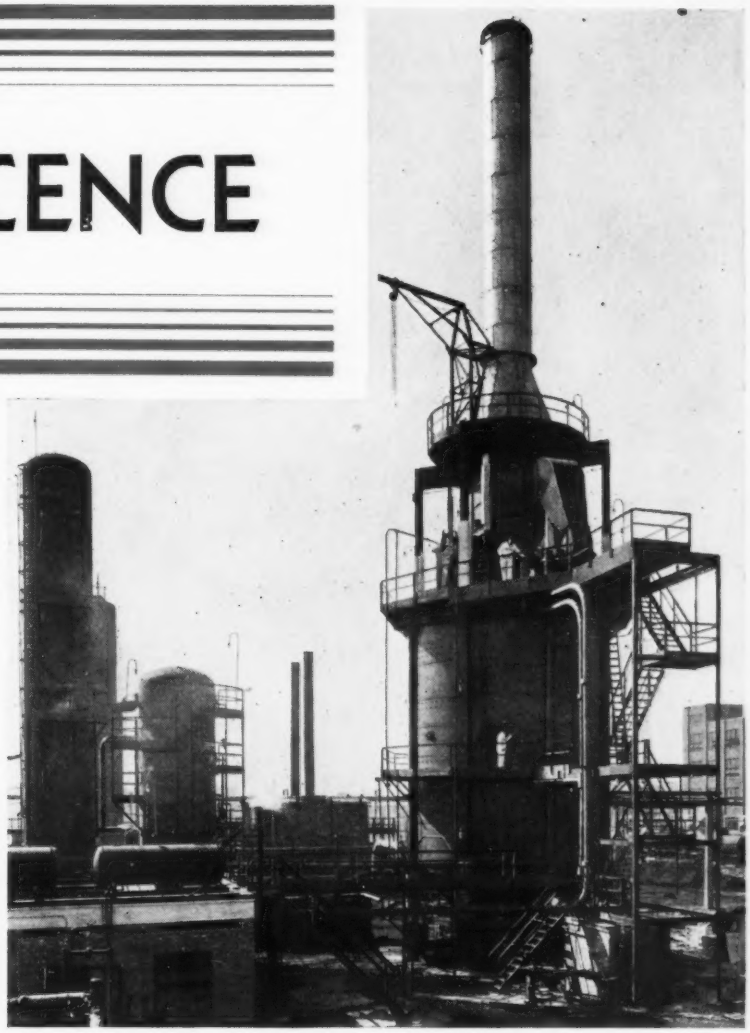
Discovery of production in the Sespe formation at Elwood has aroused interest among California operators as to possibility of duplicating the feat in other parts of the Santa Barbara coastal region. Oil sands have been cored in this formation in a number of districts in the Elwood area.

It is reported a well drilled for the Advance Petroleum Corp. about two and one-half miles northwest of the Elwood structure, cored oil sand in the Sespe at 4550 to 5100 feet, the find has not as yet been tested. General Petroleum Corp. succeeded in completing two wells in the Sespe on its Erburu lease, nine miles northwest of Elwood. However, the projects lacked kick, producing less than 200 barrels a day on the compressor and have since been shut down to comply with proration orders.

DUE to the volume of material carried in this issue on modernization of refining and marketing equipment, the 13th and concluding article by Col. George A. Burrell, on "Experiences of an American Engineer in Russia" is omitted from this number and will appear in the Nov. 4th issue.

OBSOLESCENCE

TREMENDOUS Strides in Refinery Technology in Past Decade Have Increased Yields and Reduced Operating Costs; Refiners Now Turn to Improvement of Product



The de Florez vertical tube still—as new and clean cut as a freshly minted dollar

THREE major cycles have been apparent in refining practice in the United States in the past decade.

Ten years ago refiners were devoting their energies to the problem of fractionation and cracking to increase the yield of the more valuable components of crude.

Having achieved remarkable success in the art of obtaining a larger yield of gasoline by cracking and fractionation, refiners next turned their attention to economy through the more complete utilization of the heat necessary for distillation.

The third cycle in refining progress has been qualitative rather than quantitative. The competitive situation has spurred refiners to the study of methods of improving the characteristics of their products so that they will find a more ready sale.

Each of these major cycles has forced a tremendous building program on the manufacturing branch of the industry. Competition has been such that refiners with plants made obsolete by new developments in refining practice have found that modernization building programs were imperative.

Obsolescence has thus come

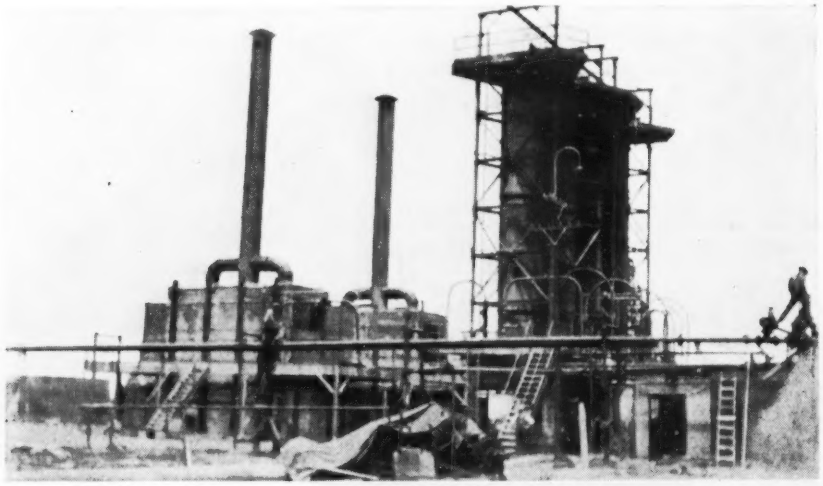
Modernization Articles To Come

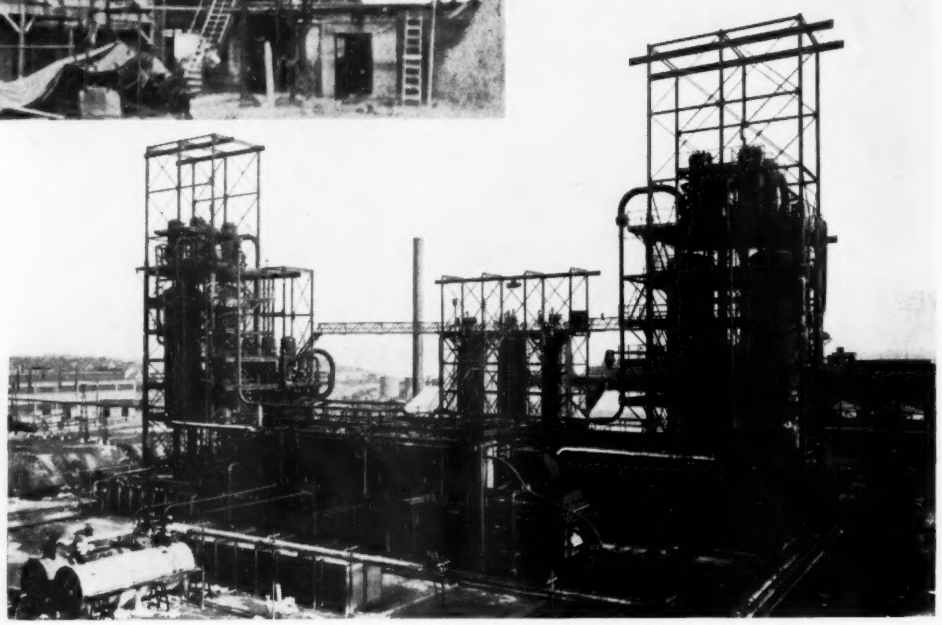
ADDITIONAL articles on the general subject of refinery modernization will appear in coming issues of NATIONAL PETROLEUM NEWS.

One of the early articles will discuss the obsolescence of cracking plants This article and one to follow it will describe methods which may be employed in revamping existing cracking units to increase the knock rating and yields of gasoline and reduce costs.

Other articles will discuss the latest trends in fractionation, furnace design for tube stills and methods of revamping older installations, atmospheric-vacuum distillation of lubricants, and various other phases of refining, including a series of about three articles on vapor recovery and stabilization.

One phase of the subject will be a discussion of the economic and bookkeeping phases of obsolescence which will be given in one or more articles now in course of preparation.





Two stages in the development of the Tube and Tank cracking process. Above is an installation of the process early in 1924. At the right is a 1930 model of the same process

made more efficient during this period also by the installation of internal flues, improvements in fire box construction through raising still settings or adding dutch ovens to improve combustion. Fuel consumption also was improved by installation of residual and vapor heat exchangers.

to achieve a place of importance, if not of honor, in the thought of the refiner. It is a term which he cannot ignore any more than he can any longer ignore "Octane Number."

A brief history of crude distillation in the past decade will show the rapidity with which refining processes have become obsolete and indicate how the refiner must take obsolescence into account in figuring his profits and setting up his reserves.

Ten years ago refiners were equipping their crude stills with simple expansion towers, atmospheric condensers and other devices to sharpen cuts between fractions. On the heels of these came the packed towers, filled with bricks, steel shavings, perforated plates, expanded metal lath, Raschig rings or whatever seemed handiest. Crude stills were rapidly being converted from batch to continuous running.

About 1923 the bubble tower began to come into use in the industry, particularly after the U. S. Bureau of Mines exhibited an experimental crude distillation unit using such a tower at the International Petroleum Exposition at Tulsa.

The advent of the bubble tower opened up a vast amount of refinery construction work by making possible the use of pipe stills for running light crude. Pipe stills had been in use on heavy crudes and for dehydration but the application had not been widespread because of the lack of an efficient method of fractional condensation or rectification.

In 1924 and 1925 there was a tremendous volume of work to be done by refiners in modernizing existing still batteries by tearing out old towers and installing bubble towers, and in replacing shell stills with the new tube stills.

Shell still batteries were

Early in 1926, at the annual meeting of the American Institute of Mining and Metallurgical Engineers, Walter Miller, now vice president of the Continental Oil Co., estimated that advances in the art of fractionation in the previous 5-year period had increased the yield of gasoline 25,000,000 barrels per year, on the basis of 1925 crude runs.

Mr. Miller estimated that savings in direct distillation costs of running light crudes had been cut 8 cents per barrel and on heavy crudes 5 cents per barrel. An additional saving in overhead of 4 cents per barrel on light oil and 2 cents on heavy oil was possible in view of the best practice at the end of 1925, he said.

If all of the old refining equipment could be converted into modern equipment at one time, Mr. Miller estimated that refiners could save $52,000,000 per year in direct distillation

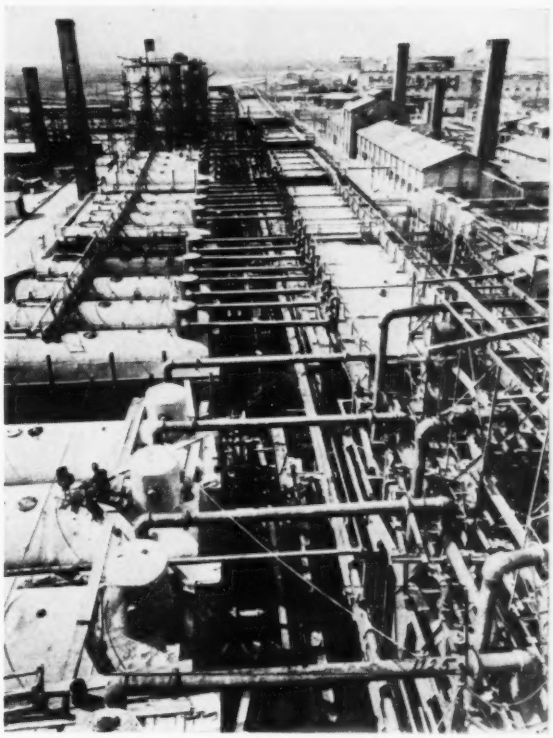
An eastern refinery of 15 years ago with a battery of cheese box batch stills; no fractionation equipment is employed

cost, under the expense which would have been necessary five years previously. There would be an additional saving of $25,000,000 in overhead in addition to the additional yield of 25,000,000 barrels of gasoline.

All this saving, of course, was not being realized at the time Mr. Miller spoke because the equipment necessary to process three-quarters of a billion barrels of crude oil per year cannot be scrapped overnight and replaced with new equipment, even though the old may be obsolete and the new capable of cutting costs to such an extent that the building is obviously imperative.

The development of the pipe still and the bubble tower in the 1924-1925 period, did, however, result in the replacement of about 10 per cent of the old shell stills with pipe stills in 1926 alone. It has been estimated that rerunning of distillates in the Mid-Continent field was reduced 75 per cent in 1926.

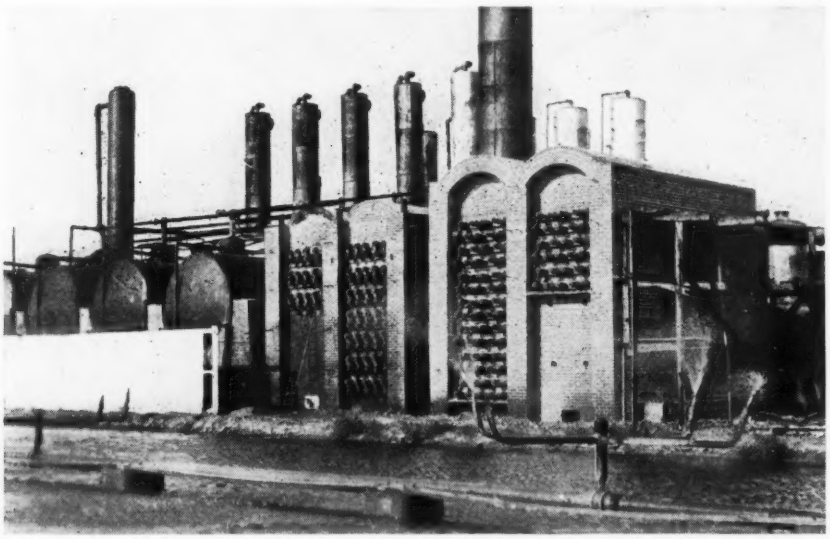
It is impossible to calculate how many times a given fraction of crude was vaporized and recondensed in the old shell still refinery such as the one pictured at the right which had no fractionating aids except for the limited amount of condensation which took place in the sloped vapor line from still to condenser box. This refinery was receiving its first batch of fractionating towers almost exactly ten years ago



As important to lubricating oil manufacture as is cracking to gasoline production, has been the introduction of vacuum stills for primary distillation of lubricating fractions. From the initial installations of the first crude vacuum units about the middle of the last decade to the present the art of vacuum distillation has advanced until practically every important lubricating oil refiner uses vacuum to obtain better fractions from which to make his finished product.

This procedure, combined with low temperature de-waxing by centrifuge or press, has revolutionized the technology of lubricant manufacture. In many cases the atmospheric-vacuum still units are doing for the lubricating oil refiner what the topping-cracking units do for the gasoline manufacturer, in solving his entire primary distillation problem.

Progress in the art of distillation did not halt as a result of the success of the large capacity, low cost pipe still, capable of producing finished products without the necessity for rerunning. In 1927 there was a marked advance in heat utilization. During that year transfer rates of 25,000 to 35,000



Early development of the pipe still after the bubble tower was perfected included applications using the pipe stills in series with shell stills. The photograph shows a 1926 revamping operation

B.t.u. per square foot of heating surface per hour had been achieved in commercial installations and engineers were talking of even greater transfer rates. Tube still furnaces were being operated with less excess air and engineers were beginning to be a little bolder in their use of radiant heat.

Additional study of heat exchangers about this time brought about a better co-ordination of residual and vapor exchangers so that crude was going to furnaces with a preheat of 200 to 500 F. Formerly a preheat of 100 to 150 F. had been considered good.

In this period refiners began to realize that their old vapor recovery systems were far from ideal. Careful analysis showed that much of the vapor condensed in these systems was lost before it reached the tank cars, due to the large proportion of propane and butane in the refinery gases, particularly those from cracking stills.

Stabilizng columns similar to those used for a number of years previously in the natural gasoline industry consequently were installed at many plants. These since have been broadened in application to the running of the cracked gasoline itself to strip it of its propane and any objectionable excess of butane.

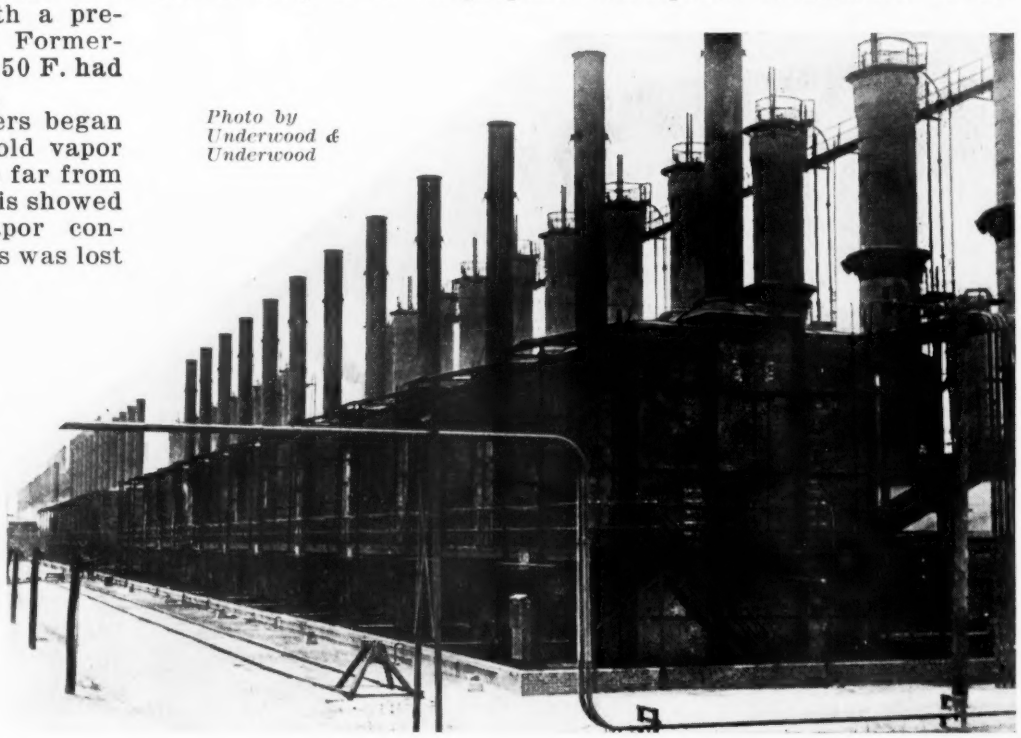
While these final refinements in heat economy and vapor saving were being added to the most modern refineries the third phase of development, competition in quality of product began to receive serious attention. In lubricating oils refiners were finding it possible to lower the pour point so that they were able to advertise to the motorist that their oils would flow at zero.

In the case of gasoline the pressure of competition led to a study of methods of increasing the anti-knock qualities of their motor fuels. Vapor phase cracking was developed to the commercial stage and temperature and pressure conditions in liquid phase cracking plants were altered to produce a superior product. Knock testing engines became a standard part of the equipment of the refinery laboratory.

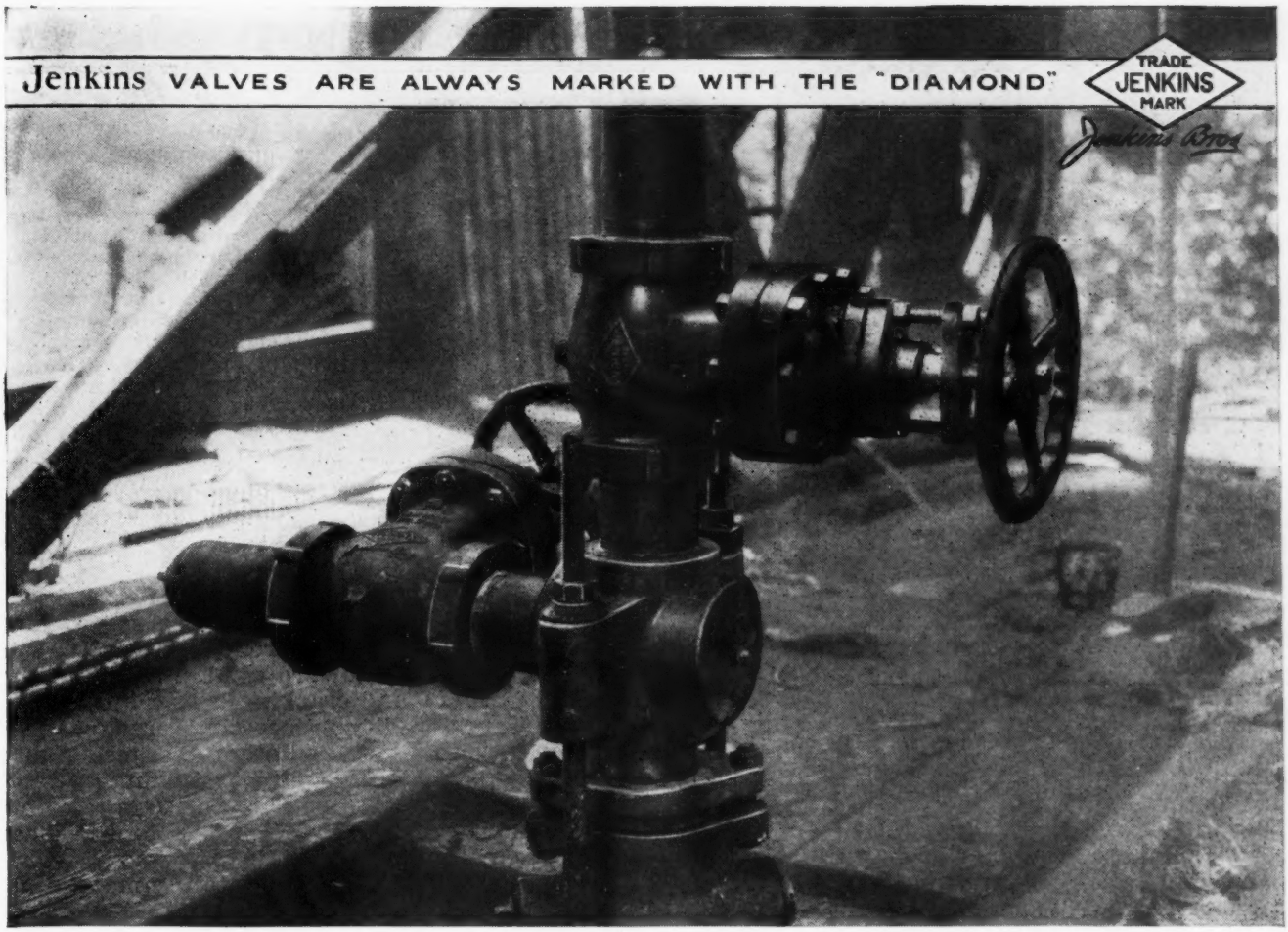
Finally the race to improve quality involved the installation of plants to crack straight run naphtha and the development of the cracking process to the point where cracked gasoline may equal or exceed the Ethyl standard for octane number.

Use of vacuum distillation and widespread installation of de-

Photo by Underwood & Underwood



A battery of 48 Gulf cracking units of the vintage of 1924 equipped with the early type of tube still furnace and with combination bubble plate and atmospheric condenser towers. The atmospheric condensers were installed above the ventilating apron in the towers at the rear

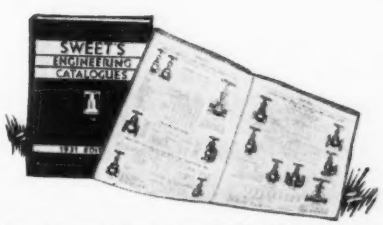


View showing two Fig. 876 Jenkins Extra Heavy Iron Body Double Disc Parallel Seat Gate Valves, screwed, with inside screw, stationary spindle. Installed on "Christmas Tree" over Well No. 2, Pentoga Gas Corporation, Bailey Farm, Wayne, N. Y. Mr. E. J. De Golier, drilling contractor.

Daily flow of 3,500,000 cubic feet controlled by Jenkins Valves

A well with a rated daily capacity of 3,500,000 cubic feet is to be treated with respect. You cannot afford to cap it with any valves except the best obtainable.

For this important service, the Pentoga Gas Corporation chose Jenkins Iron Body Double Disc Gates. As the illustration shows, there are two of these Jenkins on the "Christmas Tree" of Pentoga's initial, 3,500,000 cubic feet, record-breaking venture in the Wayne gas field.



See the complete Jenkins BOOK OF VALVES Catalogue No. 22A on pages 819 to 866, 1931 edition of Sweet's Engineering Catalogues

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A unique design in the disc and spread construction makes possible leak-tight closing in these new Jenkins Fig. 876 Double Disc Parallel Seat Gates.

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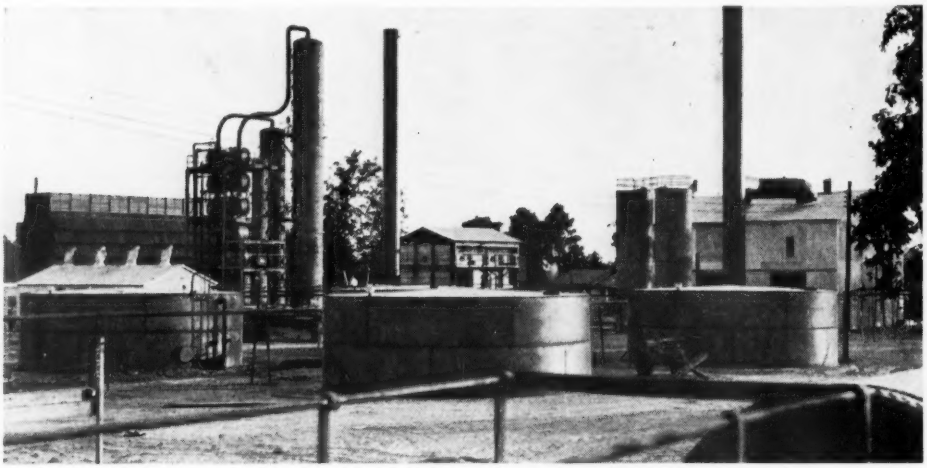


The modern skimming plant is a small, compact unit as compared with the older type plant of similar capacity. The photograph shows the entire 10,000-barrel plant of the Petroleum Refractionating Corp., at Longview, East Texas, now nearing completion

waxing equipment of the modern type made the production of improved lubricants general all over the country.

Probably the most important considerations in improvement of cracked gasoline, and in distillation results in general, are the determination of the best operating conditions, and the development of automatic and semi-automatic control equipment which give control never before thought possible. Experimental work of very exhaustive scope in many laboratories and plants has disclosed the optimum temperature, pressure and charge rate conditions for the production of maximum yields of product of the properties most desired. The work of de Florez and others has produced control instruments so sensitive and accurate that these conditions can be maintained indefinitely with the smallest degree of variation. Control of cracking plant temperatures within 2° F. is being maintained regularly in many modern plants.

It is interesting to observe that each of the major phases in refining have gotten under way in a period of stress in the industry.

Initial stages in the development of more efficient fractionation came in the early post-war slump, when low prices made it imperative for refiners to obtain a greater yield of gasoline.

Great strides in distillation through the adoption of the pipe still, and a general application of the newest fractionating towers came about through the efforts of refiners to live through the low gasoline prices of 1924, the result of the California fields pouring out a tremendous flood of crude.

The next great flood of crude resulted from the bringing in of Seminole and West Texas in 1927, Seminole adding 100,000,000 barrels of new oil to the already sufficient production of Oklahoma and West Texas adding 50,000,000 barrels to the Texas production and standing as a tremendous threat toward the close of the year.

These fields created such adverse conditions that refiners were forced to look for places where they could create savings. They became bolder in exposing tubes to radiant heat in their pipe stills thus increasing transfer rates and made great progress in utilizing residual and vapor heat to cut fuel costs.

Already the present depression is bringing its crop of new developments in refining technique which bid fair to create a new rebuilding program to wipe out accumulated obsolescence.

The building of 1932 and succeeding years probably will be of a dual nature according to present indications. It is expected to be both quantitative and qualitative.

New developments in cracking and reforming bid fair to make demands on the refiner that he either rebuild his cracking units so that they will produce modern results in volume of yield and quality of product, or replace old units, which cannot be rebuilt economically, with new units.

In the general field of distillation it appears probable that the trend will continue to be toward combining skimming and cracking operations to simplify processing, reduce fuel costs and other charges. It may be that direct cracking of crude oil may be the development which will arise as has been suggested in some sources but not yet put into commercial application.

The possibilities of hydrogenation are vast, and the extent of the value of this new development cannot be estimated yet with any certainty. Barring unforeseeable changes in the industry which will alter the entire oil situation, it is the general belief that hydrogenation will not become a major factor in refining for some years to come, and that its application will, in the immediate future, be confined to special products of relatively minor influence on the refining industry.

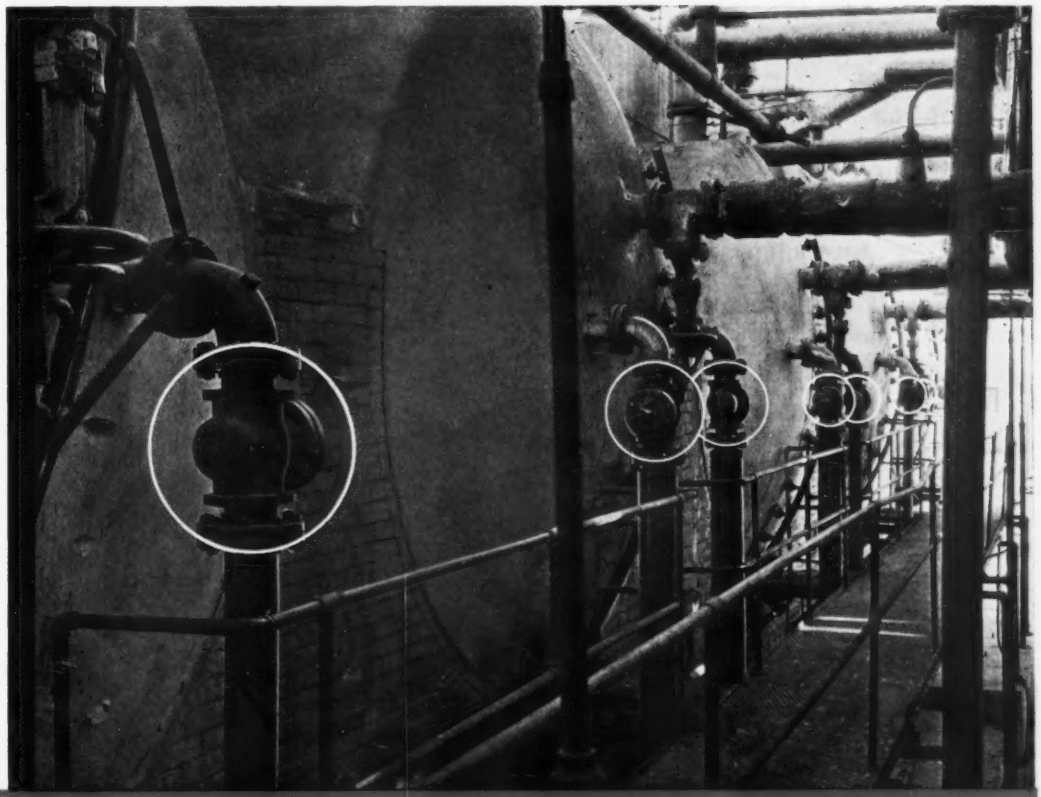
Two developments of the past few weeks appear to hold considerable possibilities for the future of the refining industry. Both are along lines which give promise of relieving the industry of expensive future construction and still permitting the production of quality products.

One of these is the discovery by Standard Oil of New Jersey technologists of a hydrocarbon which may be mixed with paraffin base lubricants to lower their pour point by inhibiting the formation of wax crystals at low temperatures. It is claimed for this product (Para-

The Perfect Application of a Principle

MERCO

Nordstrom Valves on hot oil transfer lines in a refinery



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flow) that it does not injure the color of the oils with which it is mixed, does not destroy its emulsion properties and is entirely stable when subject to recurring heating and cooling.

Another development which holds promise for the future is the experimental use of tetraethyl lead in small quantities in "regular" grades of gasoline to improve the anti-knock rating. This is being tried out in Canada by the Imperial Oil, Ltd. Thus far the Ethyl Gasoline Corp. has not offered licenses to mix Ethyl with regular gasoline in the United States but success in Canada may cause it to be adopted here later, particularly if the octane number of "regular" gasolines continues to rise as it has in the past year or so.

The use of a knock suppressor in the ordinary grades would have a tendency to relieve refiners of the necessity of reforming heavy naphthas and sustaining a heavy gas loss to improve the octane rating of gasoline which cannot be ethylized and sold at a premium.

For the past year and a half the refining industry in general has not done a great deal of building or modernization work. The industry has, however, operated at a greater rate than most lines of business. Its equipment has been subjected to the stresses of heat and pressure and gnawing of corrosion.

Discussions by the writer with a large number of refiners in recent months has led to the conclusion that building operations at refineries are to increase soon, as they have toward the end of every period of stress in the recent history of the industry. Part of the work will be in the nature of repairing and revamping older equipment which is still modern enough to pay its way. Part will be in the form of replacement of obsolete equipment with modern equipment capable of producing quality products which will sell readily at the highest going market in the greatest volume. The major equipment designers and manufacturers already are being consulted on the projected work.

There is general agreement that work to be done now will be highly advantageous to the refiner in that material costs are at their lowest ebb in many years. All sorts of steel and other metal products are selling at great discounts under prices which have been in effect when other building projects have been undertaken in the past decade.

In an effort to be of service to refiners contemplating the revamping or replacing of obsolete equipment, NATIONAL PETROLEUM NEWS begins the presentation of a series of articles discussing progress in the various departments of the refinery. Data will be presented to show what the newest installations are capable of accomplishing in cost reduction and quality improvement. Methods of modernizing older equipment also will be discussed.

In this issue will be found an article dealing with the new idea of building the refinery around the cracking plant. In future issues methods of revamping older cracking plants to increase anti-knock ratings and yields, while costs of operation are reduced will be discussed. Other articles will discuss the modernization of vapor recovery and debutanization systems in view of the latest developments and give data on what results may be expected.

Additional articles will be published on furnace design and remodeling, on the newest in cracking plant construction, lubricating oil manufacture and various other phases of refining.

An important discussion of the bookkeeping and economic phases of obsolescence including a suggested policy of creating a modernization reserve fund for refining equipment is being prepared for presentation in an early issue.

NEW EQUIPMENT

B. F. Sturtevant Co., Hyde Park, Boston, has published a catalog devoted to its new design 4 Silentvane Fan built to rotate quietly at high speeds.

The bulletin tells something of the history of fans built by B. F. Sturtevant and includes two cuts of his first volume fan, reproduced from a Sturtevant catalog in 1873.

The bulletin also includes data on the selection of fan, direction of rotation and discharge, standard fan arrangements and a typical list of installations.

* * *

The Brown Instrument Co., Philadelphia, has published a new catalog, featuring the latest developments in electric flow meters operating on the inductance bridge principle.

Among these new developments are the low range manometer and the Brown high pressure flow meter manometer, designed for measuring the flow of liquids, vapors or gases under pressures up to 5000 pounds per square inch. The low range manometer is for measuring flow of gases, being exceedingly sensitive, and capable of accurate flow measurement on very low differential pressures.

* * *

Pennsylvania Pump and Compressor Co., Easton, Pa., has formed a connection with the Byer Engineering Associates, of the same city, with branch offices at 136 Liberty St., New York and 1328 Chestnut St., Philadelphia.

The Byer organization specializes in direct contact condensing and cooling apparatus, barometric and low level jet condensers, reciprocating and steam jet vacuum pumps, gas washing apparatus and centrifugal pumps for use in connection with this equipment. Henry E. Byer, head of the firm, is well known in the condenser field, having spent 20 years in the manufacture and operation of vacuum apparatus. He was connected during this period with the Ingersoll-Rand Co. and Chicago Pneumatic Tool Co.

Combination Unit

□ □ □

By J. C. Chatfield

N. P. N. STAFF WRITER

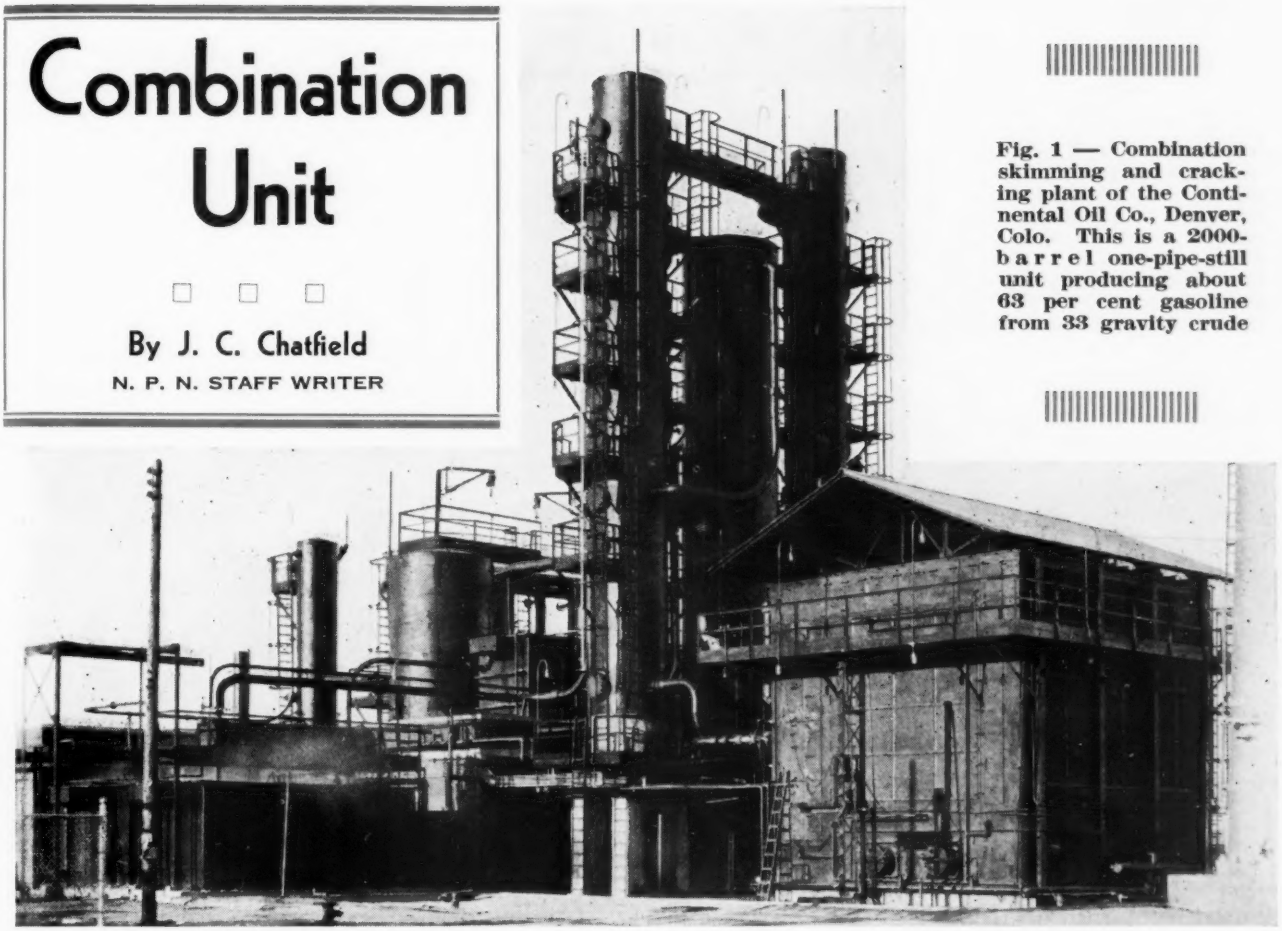

Fig. 1 — Combination skimming and cracking plant of the Continental Oil Co., Denver, Colo. This is a 2000-barrel one-pipe-still unit producing about 63 per cent gasoline from 33 gravity crude

SKIMMING and Cracking in Single Self-Contained Unit Utilizes Waste Heat of Cracking and Eliminates Refining Step to Reduce Costs

IN THE light of the newest developments of proven worth the refiner today who plans the building of new distillation equipment has two alternatives depending on the objective he has in view.

If the object of distillation is to produce lubricating oils as well as gasoline, kerosine and other products the refiner will install atmospheric - vacuum stills to produce his lube stocks in the primary distillation unit.

If the refiner proposes to produce a maximum gasoline yield at the lowest cost it appears that he will construct a unit capable of skimming and cracking in one operation or cracking crude direct. Compact, low cost units capable of completing the distillation and cracking in one operation making the fullest possible use of the heat applied are now in successful operation on a commercial basis.

Cracking directly by charging 100 per cent of the crude through the cracking zone without flashing off the straight run gasoline is proposed by one engineering firm in its recent advertising, but has not been incorporated in a commercial unit.

The assertion that skimming and cracking in a single unit is the course which the modern gasoline refiner will take in future building is based on the fact that the industry in the recent past has eagerly grasped any new method which has proven successful in eliminating one or more steps in the distillation process. Each time a step in the process of manufacturing finished goods has been eliminated the refiner has been better able to meet competition because he has lowered his cost of doing business.

Before the refining industry was in as overbuilt a condition as it is today, new ideas were not adopted as quickly as they are now, even in the building of new plants where the scrapping of old equipment was not a factor. This was largely because the economic pressure was not so great as now.

For example, the method of hooking shell stills in series to provide for continuous crude distillation was employed in England as early as 1890. In the United States it was still sparingly used 20 to 25 years later. It was not until the war period brought pressure and the post-war deflation added to the

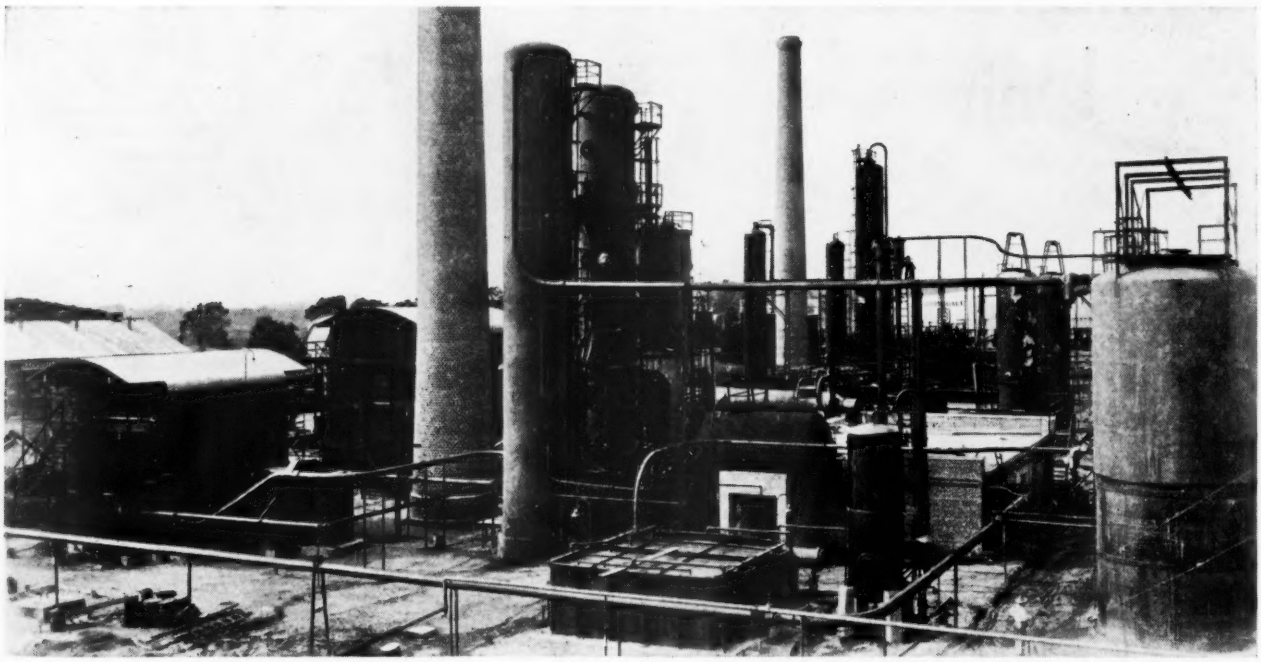

Fig. 2—A 2-still combination skimming and cracking unit at the Okmulgee plant of the Barnsdall Refineries, Inc.

gravity of the refiner's situation that continuous distillation became universal in this country.

At the present moment this appears difficult to understand since it was well known that a continuous battery for a given throughput could be built at a much lower cost than a multiplicity of batch stills. The fact that volume production could be obtained and fuel consumption possibly cut in half by continuous distillation adds to the difficulty of understanding why the method was so long in taking hold in this country.

In the case of refining installations already in place there is often even now a hesitation on the part of management to write the old equipment off the books at one stroke and spend the money for new. This is true even though the management is aware that future costs may be reduced if the step is taken.

Recently, for example, a consulting refinery engineer was called in by a certain refiner and asked to make recommendations regarding rebuilding his cracking units. In his tour of the premises the engineer observed a battery of old shell stills in crude distillation service. He at once recommended that the first step should be to discard these stills and install more modern distillation equipment.

The refiner replied that he could not afford to junk the shell stills under present conditions, saying that he could do only the building he was forced to undertake. The consulting engineer then replied that on the contrary the refiner could not afford to continue operating the shell stills under present conditions and demonstrated his contention by a cost analysis.

The engineer made the point that in good times when the refiner has a fair operating margin it may be possible for him to absorb the extra costs of shell stilling. But in times such as the present the modern idea of utilizing the waste heat of cracking for primary distillation may mean the difference between a profit and a loss.

Within the past year a certain western refiner determined to build a new refinery in one part of his territory to produce principally gasoline and fuel oil which could be shipped on a low freight rate to nearby outlets. This refiner now has a group of plants which have been built at various times in the past which have varying costs of operation.

Studying late improvements in the refining art the refiner's engineers calculated that the new plant could be built to operate at a certain cost per barrel, on a skimming and cracking basis. This would realize a large saving applicable to profits when compared with older plants still in service.

Suggestion was made to the refiner that he erect a combination cracking and skimming plant built into a single unit of the capacity he desired. When the plant was built and in operation it was discovered that the refining cost was actually 12 cents below the preliminary estimates of the refiner and even

Acknowledgment

THE author is indebted to The M. W. Kellogg Co., for valuable aid in the preparation of flow charts and compilation of cost data used in connection with the accompanying article as well as for suggestions regarding the text.

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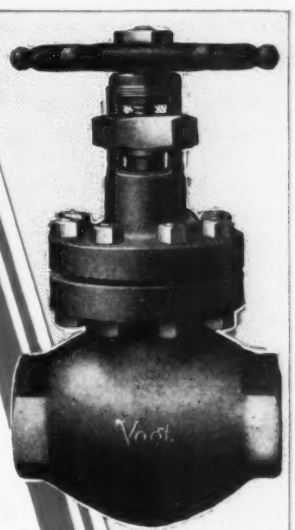

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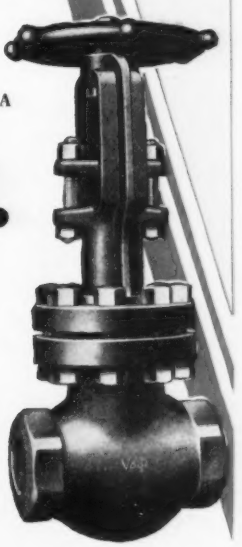
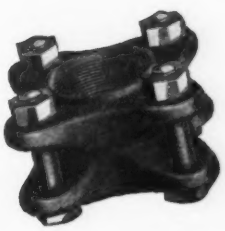




farther below the costs on the old plants.

Although the combination skimming and cracking plant in a single self-contained unit is still a relatively new departure in refining it appears now to rank in importance with the improvements made in fractionation in the 1923-1925 period which relieved the refiner of the necessity of rerunning his gasoline and kerosine distillates to obtain clean-cut fractions. Like the improvement in fractionation efficiency the combination unit eliminates a step in manufacture with its attendant costs in equipment, labor and fuel.

The combination unit may be varied in construction to suit the ideas and needs of the refiner. It may consist of a single furnace with or without split tube banks or it may be equipped with two tube still furnaces to give the new 100 per cent distilled cracking cycle.

Fig. 1 is a photograph of the combination skimming and cracking plant of the Continental Oil Co. at Denver completed recently which uses one furnace. Fig. 2 is a photograph of a two-furnace unit installed at the Okmulgee plant of the Barnsdall Refineries, Inc.

While these units may be built for the most severe cracking conditions the thought is growing in the minds of many refiners that the most economical operating method today does not involve squeezing the last possible drop of recoverable cracked gasoline from crude bottoms. Refinery engineers figure that it costs approximately five times as much to obtain a yield of between 60 and 70 per cent of the cracking still charge as it does to obtain yields up to 60 per cent.

In view of the fact that crude is cheap today and that there does not appear to be any indication that it will achieve a high price level due to scarcity in the near future, the thought of some refiners and engineers is that it is better to run more cracking stock than to crack for the highest possible yield.

During the past three years the combination type unit has been adapted chiefly for the maximum production of gasoline from crude with the greatest economy. Today, however, the refiner must of necessity produce a much better quality gasoline than in previous years at even less cost.

To meet this condition some refiners are reforming their straight run naphthas of about 40 octane number in independent units realizing about 80 per cent of 70 to 80 octane number gasolines. This is, however, a comparatively expensive operation.

Construction is progressing on certain plants, and others

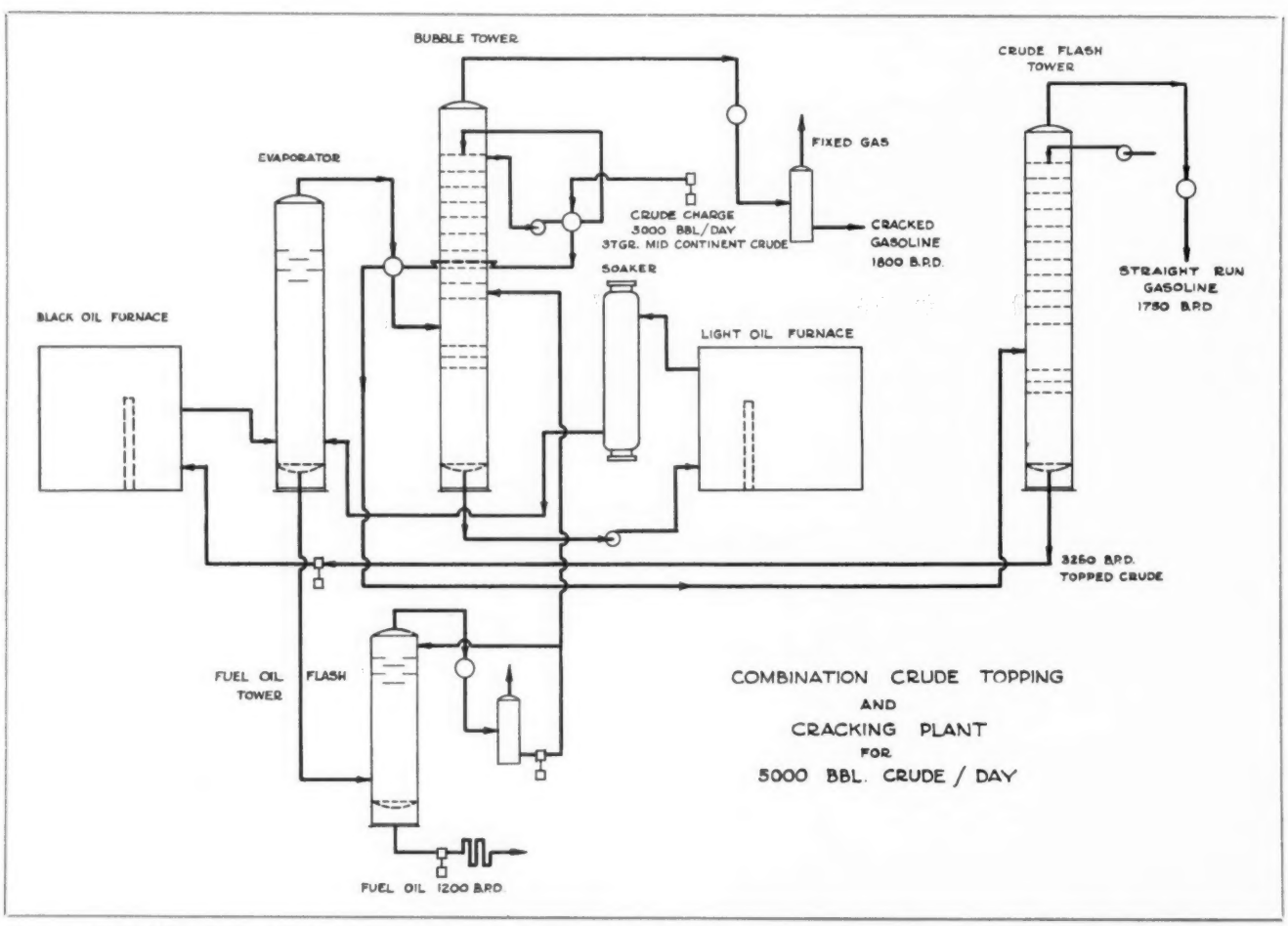
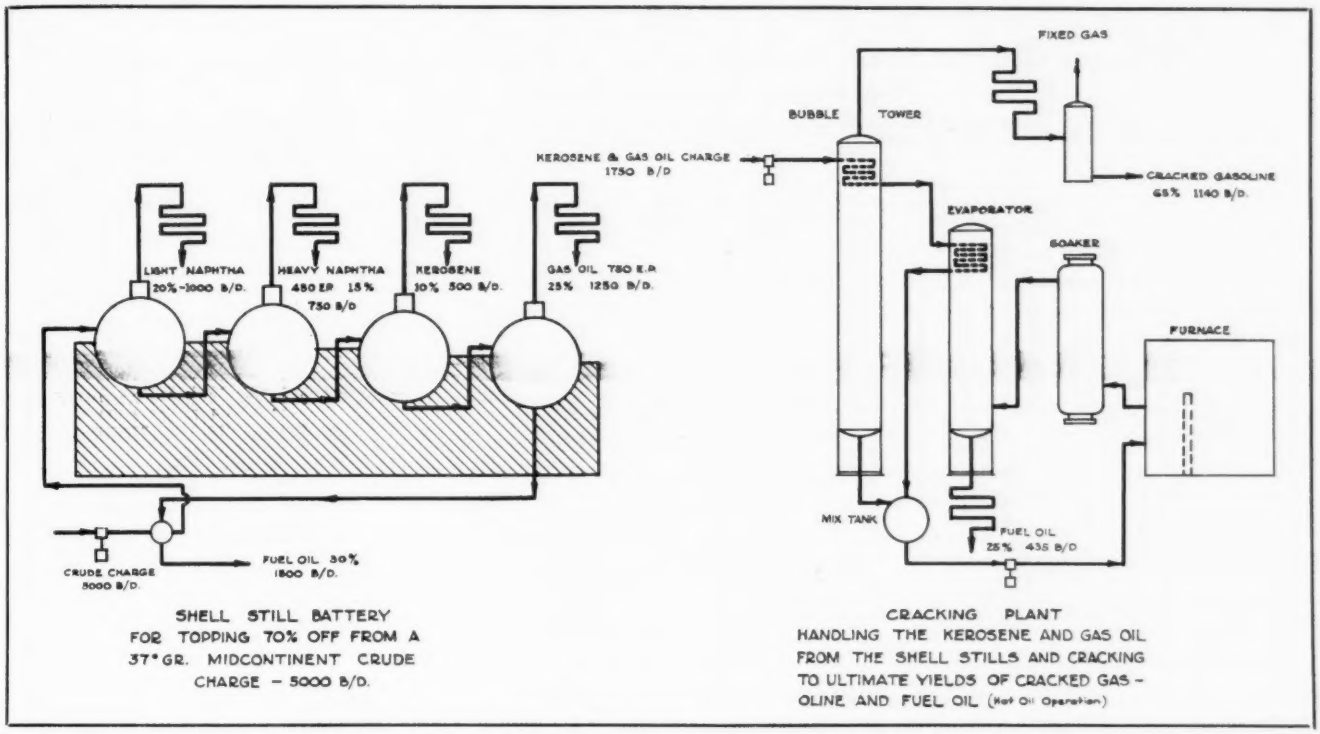


Fig. 3—Simplified flow chart of a 5000-barrel combination skimming and cracking plant. Courtesy The M. W. Kellogg Co.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CRUDE CHARGE 5000 B/D.
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SHELL STILL BATTERY FOR TOPPING 70% OFF FROM A 37° GR. MIDCONTINENT CRUDE CHARGE – 5000 B/D.
CRACKING PLANT HANDLING THE KEROSENE AND GAS OIL FROM THE SHELL STILLS AND CRACKING TO ULTIMATE YIELDS OF CRACKED GASOLINE AND FUEL OIL (Hot Oil Operation)

Fig. 4—Simplified flow chart of an obsolete shell still battery for reducing Mid-Continent crude to produce gasoline, overhead cracking stock and fuel oil bottoms. At the right is a flow diagram of a hot oil Cross unit for cracking overhead stock from the shell still battery. Courtesy The M. W. Kellogg Co.

are being projected to handle a 36 gravity Mid-Continent crude in a single combination topping and cracking unit and produce 70 per cent of 70 octane number gasoline.

To achieve this result, the straight run gasoline is removed in a crude flash tower, and part of the straight run is reformed to raise the knock rating. The topped crude is then selectively cracked producing a high anti-knock gasoline and fuel oil. The entire operation is carried on in a single self-contained unit at an operating cost per barrel of crude only slightly greater than the cost of cracking the topped crude itself.

Thus it is seen that there have been various modifications and additions to the combination crude topping and cracking cycle since the first plants were built. The cycle, however, is essentially as illustrated in the accompanying simplified flow sheet (Fig. 3). In such a system raw crude is given all the heat necessary to flash off the straight run gasoline and kerosine, if that product is desired also, through heat exchange from residual cracking heat. Temperatures in excess of 600° F. may be picked up through the exchangers in this way.

Topped crude from the base of the flash tower shown in Fig. 3 is charged to the first tube still furnace which may be termed a viscosity breaker or black oil furnace. From this furnace the topped crude is transferred to an evaporator tower from which the overhead product is cracking stock and the bottoms consist of Bunker C fuel.

The overhead cracking stock passes to the light oil furnace where it is subjected to full cracking temperatures and pressures before passing on to the soaker and into the bubble tower for fractionation.

In the type of combination unit shown in the diagram the topped crude is given a light crack to reduce the tar content, and produce a gas oil suitable both as to color and boiling range for the more intense cracking occurring in the light oil cracking zones.

Some gasoline is produced in the black oil section at a low cracking rate.

The two-furnace combination design gives 100 per cent overhead or distilled circulation for the primary high temperature cracking and thus lengthens the periods on stream. Runs of from 500 to 1000 hours on topped crude have been obtained in these units.

It is the present practice to hold pressures of 150 to 250 pounds per square inch on the fractionating system. These higher pressures permit the use of high temperatures without coke formation in the base of the evaporator due to dilution of the residuum. Fuel consumption is also reduced by this method and fixed gas requiring no absorption is produced direct from the separator.

With the higher fractionating system pressures an auxiliary fuel oil flash tower is provided as shown in the flow chart. In this tower evaporator bottoms are reduced to specification under low pressures. Overhead vapors from this tower are reintroduced into the bubble tower to become recycle stock for the light oil furnace.

The higher pressure system also involves removing gasoline

Table 1

Yields and Costs[1] of Skimming and Cracking in Combination Unit Compared with Cracking in Individual Cracking Units

	5000-Barrel Crude Topping and Cracking Plant				Shell Still Skimming and Cracking Gas Oil in 2000 Bbl. Hot Oil Unit				Shell Still Skimming and Cracking Gas Oil in Two 2000 Bbl. Cold Oil Cross Units			
YIELDS	Bbls. per Day	Per Cent of Crude	Bbls. per Month	Per Cent of Cracking Plant Charge	Bbls. per Day	Per Cent of Crude	Bbls. per Month	Per Cent of Cracking Plant Charge	Bbls. per Day	Per Cent of Crude	Bbls. per Month	Per Cent of Cracking Plant Charge
37° A.P.I. Gravity Crude Charge	5,000	100	135,000	....	5,000	100	135,000	....	5,000	100	135,000	....
Straight Run Gasoline	1,750	35	47,200	....	1,750	35	47,200	....	1,750	35	47,200	....
Kerosine	....	....	....	....	500	10	13,500	....	500	10	13,500	....
Gas Oil	....	....	....	....	1,250	25	33,800	....	1,250	25	33,800	....
Topped Crude	32,50	65	87,800	....	1,500	30	40,500	....	1,500	30	40,500	....
									For One Cold Oil Unit			
Cracking Unit Charge	3,250	65	87,800	100	1,750	35	47,200	100	1,750	35	47,200	100
Cracked Gasoline	1,800	36	48,600	55	1,140	22.8	30,800	65	570	11.4	15,400	32.5
Cracked Fuel Oil	1,200	24	32,400	37	435	8.7	11,800	25	262	5.2	7,100	15
Gas (Equivalent)	250	5	6,800	8	175	3.5	4,700	10	87	1.7	2,300	5
Recharging Stock	....	....	....	....	....	....	....	....	830	16.6	22,400	*47.5
Summary												
Straight Run Gasoline	1,750	35	47,200	....	1,750	35	47,200	....	1,750	35	47,200	....
Cracked Gasoline	1,800	36	48,600	....	1,140	22.8	30,800	....	1,140	22.8	30,800	....
Fuel Oil	1,200	24	32,400	....	1,935	38.7	52,300	....	1,935	38.7	52,300	....
Gas (Equivalent)	250	5	6,800	....	175	3.5	4,700	....	175	3.5	4,700	....
COST	Quantity	Unit Cost	Monthly Cost		Quantity	Unit Cost	Monthly Cost		Quantity	Unit Cost	Monthly Cost	
Fuel	5% of Crude	$0.25	$1,690		6.5% of Crude	$0.25	$ 880		3.4% of Crude	$0.25	$ 460	
Steam (Lbs. per Hour)	25,800	.30	4,860		15,000	.30	2,920		6,500	.30	1,270	
Water (G.P.M.)	2,000	.01	780		1,000	.01	390		300	.01	117	
Electricity (K.W.H.)	30	.01	194		20	.01	127		100	.01	460	
Operating Labor (Men per Day)	7	5.60	1,180		7	5.60	1,180		7	5.60	1,180	
Maintenance Labor (Men per Day)	2	5.60	336		2	5.60	336		2	5.60	336	
Maintenance (Material)	....	....	835		....	....	500		....	....	334	
Cleaning	....	....	100		....	....	100		....	....	100	
Total Operating Cost	....	....	$9,975		....	....	$6,433		....	....	$4,447	
Fixed Charges	....	....	9,600		....	....	5,750		....	....	3,840	
Total Monthly Operating cost			$19,575				$12,183				$8,287	
Cost of Bbl. of Crude Charge			0.145				0.0902			For One Unit	0.0614	
										For One Unit	0.1228	
Shell Still Topping Cost per Bbl.			.....				0.0542				0.0542	
Total Cost per Bbl. of Crude Charge			$0.145				$0.1444				$0.177	

[1]Cost figures do not include Cracking Royalties, Treating, Transfer, Storage or Selling Costs.
*To be Cracked in other Cold Oil Unit.

from the top of the bubble tower, outside cooling and return to the tower as cold reflux to regulate overhead temperatures.

To achieve yields comparable to those obtained from the combination unit the older type refinery reduces crude in a shell still battery or a pipe still, condenses the various fractions and charges the gas oil or kerosine and gas oil to the cracking unit as illustrated in the simplified sketch (Fig. 4). The sketch shows a typical shell still battery and a Cross cracking plant of the hot oil type.

To illustrate the difference in refining costs between a combination unit and the old method of skimming and cracking in separate units Table 1 has been prepared. This tabulation attempts to give only distillation and cracking costs. No figures have been included to cover cracking royalties, however, or costs of finishing products, transferring to storage, overhead sales cost and the like. These expenses not shown are assumed to be the same with either type of operation.

The shell still operation is based on reducing the crude to 30 per cent bottoms of marketable fuel oil, not running down to pitch as is done, of course, in many shell still batteries. Carrying the crude down to pitch or coke, would of course, provide more cracking stock but at a greater expense.

With present crude costs, the justification for incurring the added cost for the greater yield obtained must be determined for each individual plant under its specific conditions.

Reference is made to columns 2 and 3 in the table which include the costs of cracking the 1750 barrels of kerosine and gas oil from the shell stills in both a hot oil and a cold oil Cross unit.

One hot oil unit handles the charge at a cost of 9.02 cents

Table 2

Cost of Shell Still Reduction of 37 Gravity Mid-Continent Crude to 30 Per Cent Bottoms

	Quantity	Unit Cost	Monthly Cost
Steam (Pounds per Hour)	7300	$0.30	$1,420
Fuel (Per Cent of Crude)	2.95	.25	996
Water (Gallons per Hour)	1400*	.01	9
Electricity	Negligible		
Operation Labor (No. of Men)	7	5.60	1,180
Maintenance Labor			135
Maintenance Material			338
Fixed Charges			3,240
Total Shell Stilling Cost			$7.318
Cost per Bbl.			$0.0542

*Make-up only. Plant equipped with cooling tower.

based back on a barrel of crude, while two cold oil units are required for the same duty at an operating cost of 12.28 cents based back on a barrel of crude charge.

On the other hand, the single self-contained unit skims the crude and produces 1800 barrels of cracked gasoline, as compared to only 1140 barrels shown for the shell stilling and subsequent cracking operation, at an operating cost of 14.5 cents per barrel of crude charge.

If the crude were reduced to a heavy pitch or coke amounting to approximately 5 per cent of the feed in the shell stilling operation, 3000 barrels of charging stock would be available for the subsequent cracking operation.

The cost of cracking this stock in a hot oil unit to produce an amount of cracked gasoline equivalent to the 1800 barrels noted for the combination unit would amount to 13½ to 14 cents based back on a barrel of crude. This allows less than 1 cent for the topping operation, which cannot be approached in the most modern topping unit.

The costs noted in the tabulation include the actual operating cost of manufacturing the raw gasoline plus fixed charges on the plant investment.

Table 2 gives an estimate of the cost of reducing 5000 barrels of 37 gravity Mid-Continent crude to 30 per cent bottoms, using the same cost factors as those employed in Table 1. The table is based on shell still operation. Quantities of steam, fuel, etc., were taken from the records of a refiner using this class of crude and adjusted to the capacity basis indicated.

The topping cost of 5.42 cents per barrel from this table has been inserted in Table I to give comparable costs of the combination unit with the skimming and cracking in separate units.

As pointed out previously the gasoline yield is 660 barrels per day less in the separate unit type of operation although costs are almost identical in the combination unit and the hot oil unit plus shell still operation. In the case of the older cold oil units the yield still is 660 barrels of gasoline lower than in the combination unit and the cost per barrel is 3.2 cents per barrel higher.

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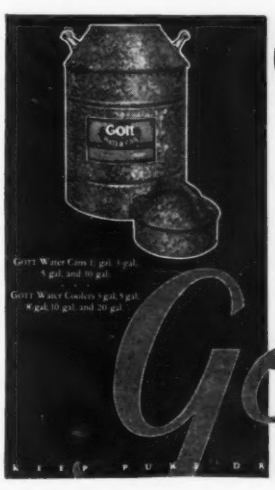

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Production of Benzol by Pyrolysis Of Natural Gas[1]

By H. M. Smith,[2] Peter Grandone,[3] and H. T. Rall[4]

THIS report on the pyrolysis of methane describes the apparatus used in the experimental study, tabulates the data obtained, and utilizes these data to show the results graphically. No effort was made to compare results with those of other investigators because the data are not on a comparative experimental basis, and because there are some contradictory results about which the authors desire more confirmation. From the data obtained in this investigation the following conclusions have been drawn tentatively:

(1) The pyrolysis of methane yields (exclusive of carbon and hydrogen) higher hydrocarbons, among which the following have been identified: ethylene, acetylene, benzene, naphthalene, anthracene and pyrene. Furthermore, there are other gases present in small amounts, among which methyl acetylene is suspected; unsaturated liquids boiling below and above benzene; and liquids and solids of very high boiling point, presumably high in carbon content.

(2) The yields of these products obtained from methane at atmospheric pressure depend on the temperature and flow rate through the cracking zone, assuming other factors to be equal. However, an increase in duration of heating is not equivalent in all respects to an increase in temperature.

(3) Ethylene appears to be the dominant factor at the beginning of the pyrolysis, the other hydrocarbons being formed subsequently; but it is impossible to determine yet whether the light oil proceeds from ethylene or acetylene.

(4) Dilution of the gas with either nitrogen or hydrogen affects the yields, probably due primarily because of heat transfer and polymerization. In addition hydrogen decreases the yields due to suppressing the dissociation of the methane. With both diluent gases the percentages of ethylene and acetylene *in the total products* are increased.

(5) Due to the decreased yield with hydrogen recycling of the exit gases would not be feasible unless the hydrogen were first removed.

(6) Ethane admixed with methane increases the yields of all products considerably.

(7) The relationship between the yield and the variable factors is well shown by isometric figures.

(8) The optimum operating conditions may be approximated by a consideration of the rate and amount of production.

Further work is in progress to show more fully the effects

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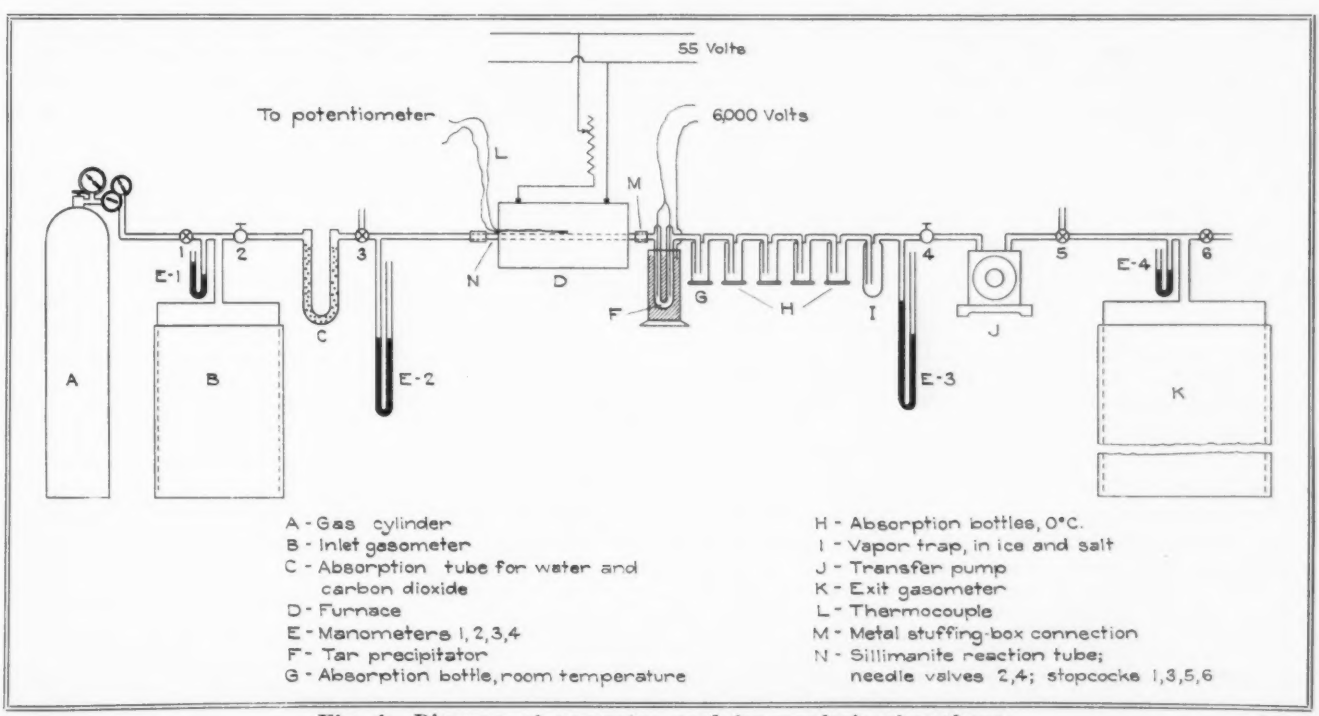

Fig. 1—Diagram of apparatus used for pyrolysis of methane

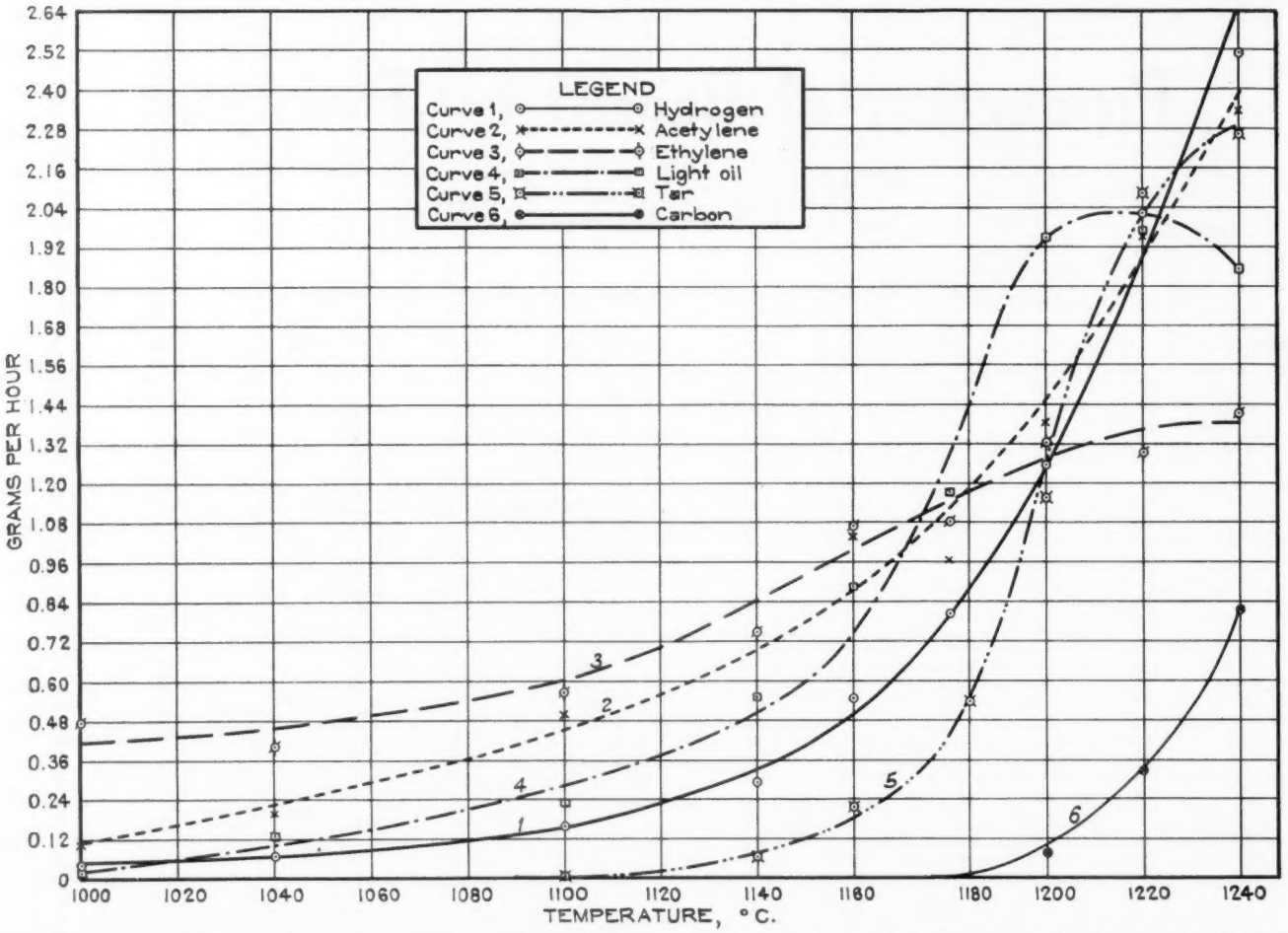

Fig. 2—Curves from pyrolysis of methane at several temperatures and a constant flow rate, showing yield of each product in grams per hour

of such factors as diameter, length and material of tube; preheating of incoming gas; and subsequent treatment of the exit gas as it emerges from the cracking zone.

The best average yields so far obtained from 1000 cubic feet of methane under suitable pyrolytic conditions are approximately 0.3 gallon of light oil, largely benzene, and 2.5 pounds of liquid tar containing about 35 per cent napthalene and antracene, and 65 per cent of unknown hydrocarbons. In addition there remains about 1200 cubic feet of gas containing 710 cubic feet of methane, 440 cubic feet of hydrogen, and 25 cubic feet each of ethylene and acetylene. This residue gas has a calorific value of 775 gross B.t.u. per cubic foot at 60°F. and 30 inches of mercury.

The presence of the small amounts of ethane (5 to 15 per cent) that generally occur in natural gas increases the yield* of liquid products markedly. Inert diluents, such as nitrogen, have no adverse effect unless present in large amounts. Hydrogen tends to depress the yield, while acetylene and ethylene cause an increase. Since these last three gases are not present in natural gas, their action need not be considered except as they may affect the different equilibriums obtained in the cracking furnace.

These general results are based on work done at the Bureau of Mines Petroleum Experiment Station, Bartlesville, Oklahoma, and will be described more fully in Report of Investigations No. 3143.

*Yield is calculated on the total hydrocarbons present.

Experimental Methods

Pyrolysis

Apparatus

Figure 1 shows a diagrammatic drawing of the apparatus used in studying the pyrolysis of both pure methane and mixtures of methane with other gases. In all runs, the gas, under pressure in cylinder *a*, is released through a reducing valve and a stopcock (1) into the glycerine-sealed gasometer *b*. The gas leaves the gasometer through the needle valve (2), passes through a U-tube filled with absorbents to remove traces of carbon dioxide and moisture, and then through a stopcock 3 into the reaction tube, heated by an electric furnace, *d*. The temperature is indicated by a platinum platinum-rhodium thermocouple *l* fastened to the outside of the reaction tube. The sillimanite reaction tube *n* has an outside diameter of 8.5 millimeters, an inside diameter of 6.7 millimeters and a length of 61 centimeters. It connects at its exit end to a small Cottrell-type precipitator, *f*, by means of a metal stuffing box connection, *m*. The Cottrell type precipitator is a U-shaped glass tube, each limb of which has an axial wire connected in parallel to one terminal of a high-voltage transformer. The tube is immersed up to its side arms in a jar of water connected to the second terminal of the transformer.

Absorber bottle *g* traps naphthalene vapors in tetrahydro-

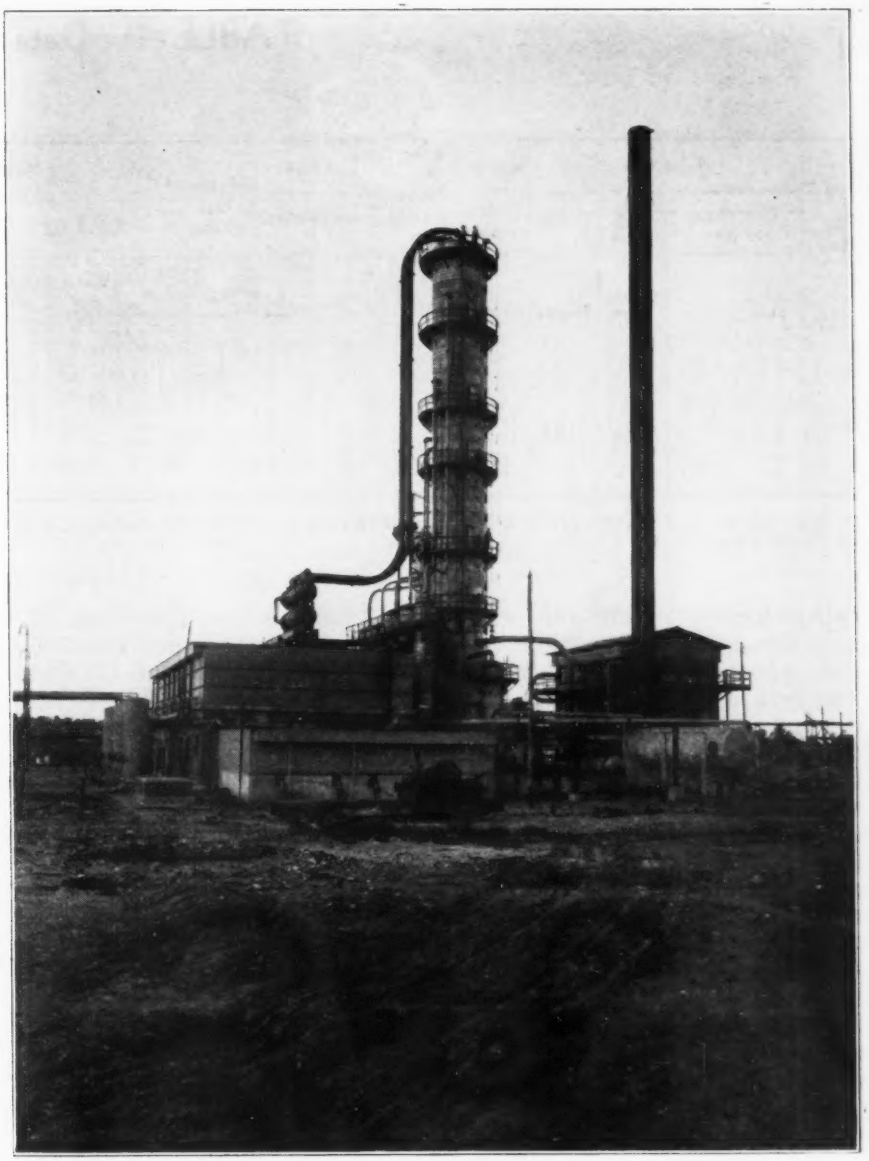

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TABLE 1—Data Obtained from Pyrolysis

Series A—

Run No.	Inlet Gas: Flow Rate per hour, Cubic Feet	Inlet Gas: Flow Rate per hour, Liters	Inlet Gas: Total Volume S.T.P., Cubic Feet	Inlet Gas: Total Volume S.T.P., Liters	Weight of Hydrocarbons, Grams	Furnace Temperature, °C.	Exit Gas: Total Volume S.T.P., Cubic Feet	Exit Gas: Total Volume S.T.P., Liters	Volume Increase, Per cent	Non-Gaseous Products: Light Oil, Grams	Light Oil, Wght. Per cent	Light Oil, Gals. per 1000 cu. ft.	Tar, Grams	Tar, Wght. Per cent	Carbon, Grams	Carbon, Wght. Per cent	Light Oil-Tar Ratio	Duration of Run Hours
A-1	2.16	61.1	3.95	111.7	79.5	1000	3.92	110.8	—0.8	0.04	0.05	<.010	.....	.....	.....	.....	.....	2.0
A-2	1.96	50.9	1.80	50.9	36.2	1040	1.88	53.1	1.2	0.13	0.36	0.022	.....	.....	.....	.....	.....	1.0
A-3	2.03	57.4	9.06	256.4	182.6	1100	9.44	267.2	4.2	1.18	0.65	0.039	0.04	0.02	.....	.....	29.5	5.0
A-4	2.19	62.0	9.21	260.8	185.6	1140	9.71	274.8	5.6	2.53	1.36	0.083	0.30	0.16	.....	.....	8.6	4.6
A-5	2.19	62.0	9.57	270.8	192.8	1160	10.23	289.6	6.9	4.07	2.11	0.129	1.00	0.52	0.0	0.0	4.1	4.6
A-6	2.01	56.8	8.56	242.4	172.6	1180	9.32	263.8	8.9	5.53	3.20	0.194	2.53	1.47	.....	.....	2.3	4.7
A-7	2.01	56.8	7.85	222.0	158.2	1200	8.99	254.2	14.5	8.22	5.20	0.314	4.88	3.09	0.32	0.20	1.6	4.2
A-8	2.02	57.2	3.92	111.4	79.4	1220	4.82	136.6	22.6	4.34	5.47	0.334	4.59	5.29	0.72	0.91	1.0	2.2[1]
A-9	2.13	60.2	1.22	34.4	24.4	1240	1.50	42.4	23.5	1.16	4.74	0.287	1.37	5.60	0.49	2.01	0.9	0.6[1]

(1) Runs thus indicated were of short duration due to carbon stoppage.
(2) Ethylene as reported includes any ethane which may have been present.
(3) Volume per cent based on exit gas.
(4) Weight per cent based on weight of input hydrocarbons.

naphthalene at room temperature, and the light oil is removed in the absorber bottles *h*, which also contain tetrahydronaphthalene but which are packed in ice and are equipped with fritted glass discs through which the gas passes. The gases are pulled through the absorber bottles by the glycerine-sealed transfer pump *j* and delivered into the large gasometer *k*.

Procedure

The reaction tube is heated and all combustible material burned out with a stream of air and oxygen before a run is made. The furnace is then brought to the desired temperature. Each of the absorption bottles and the tar precipitator are weighed carefully before being connected. The system then is purged of air by a steam of nitrogen admitted at stopcock 3. When the temperature has become constant, the gas is admitted to the system by turning stopcock 3 and the rate is carefully regulated.

Readings on the inlet gasometer are taken every few minutes to keep the velocity under constant supervision. The gas is allowed to flow through the entire apparatus to stopcock 5, where it is diverted into the atmosphere until the presence of cracked gas (acetylene) can be detected by odor. The flow is then turned into the exit gasometer.

The amount of gas allowed to escape is determined by the amount run out of the inlet gasometer during the short period that the gas is diverted to the atmosphere. The run is continued under the desired conditions until about 10 cubic feet of exit gas have been collected, or until the reaction tube becomes clogged with carbon, which is indicated by a rapid increase in pressure on manometer E-2, and a simultaneous pressure decrease on E-3. In either case, the exit gasometer is closed, nitrogen passed through the system into the atmosphere, heating stopped, gasometers read, and atmospheric pressure and temperature determined. The absorption bottles, vapor trap, and precipitator are then removed and weighed.

A rough check of the amount of light oil obtained is made by recovering the light oil from the solvent by distillation. After the total weight of tar in the precipitator is ascertained, the soluble material is washed out with chloroform through a fritted glass crucible, leaving any carbon present in the tar as a residue. This, added to such carbon as can be removed from

TABLE 2—Data Obtained from Pyrolysis

Series B and C—

Run No.	Inlet Gas: Flow Rate per hour, Cubic Feet	Inlet Gas: Flow Rate per hour, Liters	Inlet Gas: Total Volume S.T.P., Cubic Feet	Inlet Gas: Total Volume S.T.P., Liters	Weight of Hydrocarbons, Grams	Furnace Temperature, °C	Exit Gas: Total Volume S.T.P., Cubic Feet	Exit Gas: Total Volume S.T.P., Liters	Volume Increase, Per Cent	Non-Gaseous Products: Light Oil, Grams	Light Oil, Wght. Per Cent	Light Oil, Gals. per 1000 Cu. Ft.	Tar, Grams	Tar, Wght. Per Cent	Carbon, Grams	Carbon, Wght. Per Cent	Light Oil-Tar Ratio	Duration of Run Hours
B-1	2.52	71.4	8.15	230.6	164.2	1200	9.10	257.6	11.7	5.59	3.40	0.206	3.03	1.85	0.0	0.0	1.8	3.5
B-2	2.01	56.8	7.85	222.0	158.2	1200	8.99	554.2	14.5	8.22	5.20	0.314	4.88	3.09	0.32	0.20	1.6	4.2
B-3[1]	1.56	44.2	3.82	108.2	77.0	1200	4.68	132.4	22.5	4.64	6.01	0.364	4.49	5.83	0.99	1.29	1.0	2.7
B-4[1]	1.15	32.6	0.52	14.8	10.6	1200	0.67	19.0	28.4	0.47	4.46	0.268	0.56	5.32	0.44	4.18	0.8	0.5
C-1	2.93	83.0	8.11	229.6	163.6	1220	9.44	267.2	16.4	5.18	3.17	0.192	5.87	3.59	0.29	0.17	0.9	3.0
C-2[1]	2.47	70.0	5.60	158.6	112.8	1220	6.77	191.8	21.0	6.35	5.63	0.341	5.79	5.13	1.63	1.45	1.1	2.5
C-3[1]	2.02	57.2	3.94	111.4	79.4	1220	4.82	136.6	22.6	4.34	5.47	0.334	4.59	5.78	0.72	0.91	1.0	2.2
C-4[1]	1.66	47.0	0.82	23.2	16.6	1220	1.05	29.6	27.4	0.68	4.11	0.257	1.08	6.52	0.85	5.12	0.6	0.5

[1] Runs thus indicated were of shorter duration due to carbon stoppage.
[2] Ethylene as reported includes any ethane which may have been present.
[3] Volume per cent based on exit gas.

of Virtually Pure Methane

Constant Flow Rate

Run No.	Exit Gas Analysis																Total Products Produced	
	Hydrogen			Acetylene			Ethylene			Ethane			Methane			Difference		
	Vol. Per cent[3]	Grams	Wght. Per cent[4]	Vol. Per cent[3]	Grams	Wght. Per cent[4]	Vol. Per cent[3]	Grams	Wght. Per cent[4]	Vol. Per cent[3]	Grams	Wght. Per cent[4]	Vol. Per cent[3]	Grams	Wght. Per cent[4]	Vol. Per cent[3]	Grams	Wght. Per cent[4]
A-1	0.9	.09	0.11	0.16	0.20	0.25	0.68	0.95	1.20	0.24	0.35	0.44	.....	.....	.....	98.02	1.28	1.61
A-2	1.5	.07	0.19	0.32	0.20	0.55	0.62	0.40	1.10	0.17	0.12	0.33	.....	.....	.....	97.39	0.80	2.21
A-3	3.7	.89	0.49	0.80	2.50	1.37	0.84	2.85	1.46	<0.10	.....	.....	93.1	178.4	97.6	1.56[5]	7.46	4.08
A-4	5.4	1.33	0.72	0.56	1.80	0.97	1.00[2]	3.45	1.86	.....	.....	.....	88.4	174.4	93.9	4.64[5]	9.41	5.07
A-5	9.9	2.56	1.33	1.42	4.80	2.49	1.36[2]	4.95	2.57	.....	.....	.....	85.8	178.2	92.4	1.52[5]	17.38	9.02
A-6	16.0	3.78	2.19	1.48	4.55	2.63	1.54[2]	5.10	2.95	.....	.....	.....	77.0	145.6	84.3	3.98[5]	21.49	12.45
A-7	23.2	5.30	3.35	1.98	5.85	3.70	1.74[2]	5.60	3.58	.....	.....	.....	70.4	128.6	81.3	2.68[5]	30.17	19.08
A-8	36.4	4.46	5.62	2.68	4.30	5.42	1.66[2]	2.85	3.59	.....	.....	.....	56.8	55.6	70.0	2.46[5]	21.26	26.08
A-9	39.6	1.51	6.19	2.82	1.40	5.74	1.56[2]	0.85	3.48	.....	.....	.....	54.1	16.6	68.0	1.92[5]	6.78	27.80

(5) Difference is composite percentage of oxygen, nitrogen, carbon dioxide and carbon monoxide in runs A-3 to A-9 inclusive. In A-1 and A-2 methane is included.

the reaction tube, gives an approximation of the total weight of carbon formed. Such a determination is rather inaccurate, and the results are almost always somewhat low, especially if much carbon is formed.

Gas Analysis

The exit gases were analyzed by a fractionating column similar to that described by Oberfell and Alden[5] and by Podbielniek[6], they were silvered as suggested by the latter. The receiving system of the gas analysis apparatus differed from the customary form used with columns of this type in that the single bottle was replaced by several calibrated receivers of various sizes connected by a manifold so that the gas fractions from the distillation could be collected separately. The general scheme of analysis is shown in Figure 3.

[5]Oberfell, G. G., and Alden, R. C., Fractionation at Low Temperature, Oil and Gas Jour. Vol. 27, Oct. 18, 1928, p. 142.

[6]Podbielniak, W. J., Fractional Distillation Analysis, Refiner and Natural Gasoline Mfg. Vol. 8, March, 1929, pp. 55-65.

Experiments with Pure Methane

The runs made with virtually pure methane were called series A, B, and C. The data obtained from these runs are shown in Tables 1 and 2. Gas of the following percentage composition was used in series A, B and C: Methane, 98.4; ethane, 1.0; nitrogen, 0.5; and oxygen, 0.1. The same Sillimanite tube was used in all experiments, and was burned out with air and oxygen between each run. All conditions, such as pressure, temperature of absorption bottles, and amount of absorption oil were kept constant; only the gas-flow rate or furnace temperature was varied. The data for series A, B and C are shown graphically in Figures 4 to 8.

Series A, Constant Velocity

This set of runs was conducted at a constant rate of flow, the maximum variance being from 1.96 to 2.19 cubic feet per hour. Temperatures from 1000°C. for A-1 to 1240°C. for A-9 were used. Figure 2 shows the yield of the various products in grams per hour. A consideration of these curves indicates that the values for hydrogen, acetylene and carbon, Curves 1, 2 and 6, all increase continuously with increase of temperature; whereas those for ethylene, curve 3, and tar, curve 5, tend to fall off at the higher temperatures. The light-oil yield, curve 4, reaches a definite maximum between 1200°C.

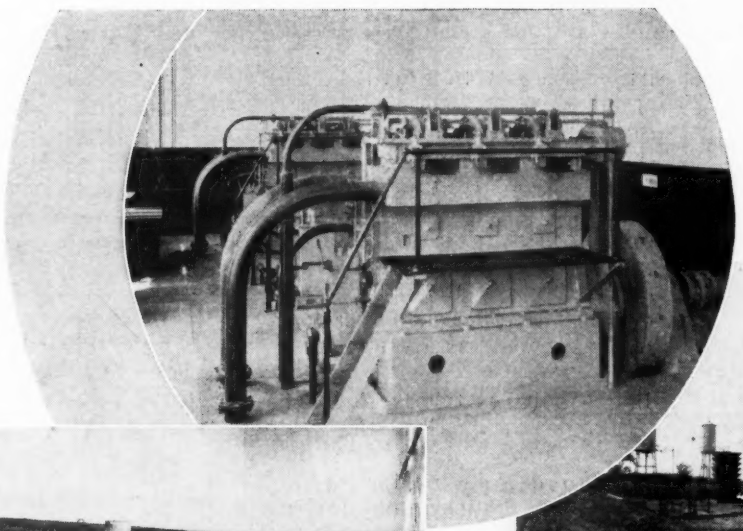
of Virtually Pure Methane

Constant Temperatures

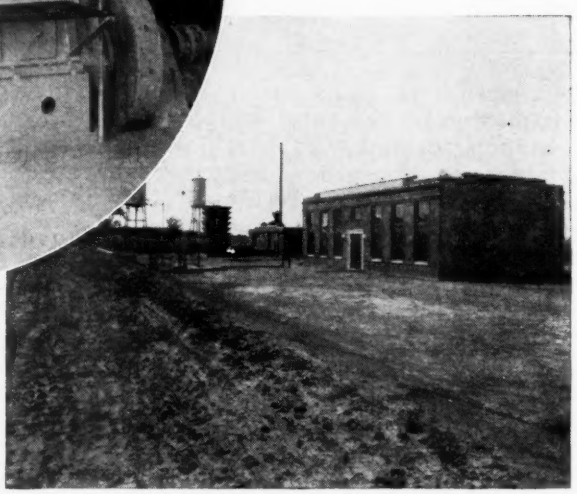
Run No.	Exit Gas Analysis														Total Products Produced	
	Hydrogen			Acetylene			Ethylene[2]			Methane			Difference[5]			
	Volume per cent[3]	Grams	Wght. per cent[4]	Volume per cent[3]	Grams	Wght. per cent[4]	Volume per cent[3]	Grams	Wght. per cent[4]	Volume per cent[3]	Grams	Wght. per cent[4]	Volume Per cent[3]	Grams	Wght. Per cent[4]
B-1	18.1	4.17	2.54	2.14	6.45	3.93	1.60	5.15	3.14	76.4	141.0	85.85	1.76	24.39	14.85
B-2	23.2	5.30	3.35	1.98	5.85	3.70	1.74	5.60	3.58	70.4	128.6	81.30	2.68	30.17	19.08
B-3[1]	36.7	4.35	5.63	2.06	3.50	4.55	1.68	2.50	3.25	58.2	55.2	71.70	1.86	20.47	26.60
B-4[1]	47.8	0.82	7.73	2.08	0.50	4.73	1.78	0.40	3.77	46.1	6.2	58.50	2.24	3.19	30.30
C-1	25.1	6.03	3.67	2.44	7.65	4.68	1.72	5.80	3.54	67.9	130.0	79.50	2.84	30.82	18.85
C-2[1]	34.9	6.05	5.32	2.82	6.35	5.62	1.64	3.95	3.50	58.5	80.6	71.40	2.14	30.12	26.70
C-3[1]	36.4	4.46	5.62	2.68	4.30	5.42	1.66	2.85	3.59	56.8	55.6	70.00	2.46	21.26	26.80
C-4[1]	49.6	1.32	7.95	2.34	0.80	4.82	1.64	0.60	3.61	45.0	9.6	57.80	1.42	5.33	32.20

[4] Weight per cent based on weight of input hydrocarbons.
[5] Difference is composite percentage of oxygen, nitrogen, carbon dioxide and carbon monoxide

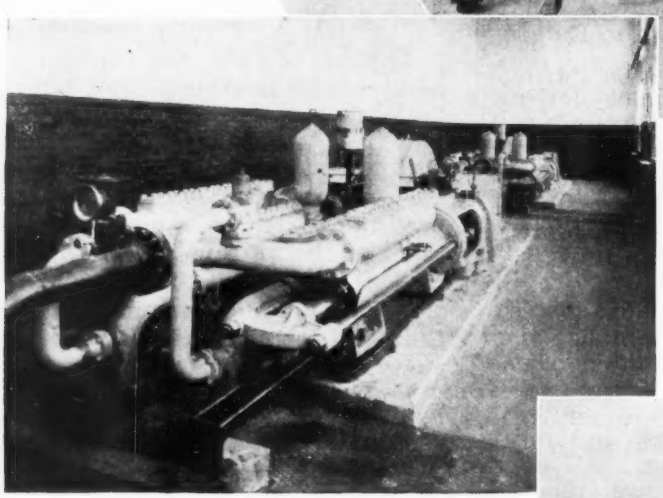
THE LONGEST GASOLINE



Engine Room—Typical 6-inch Station



Typical 6-inch Station—showing Cooling Tower, Manifold and Tanks



Pump Room—Typical 6-inch Station

Des Moines Station—Junction and Terminal Station

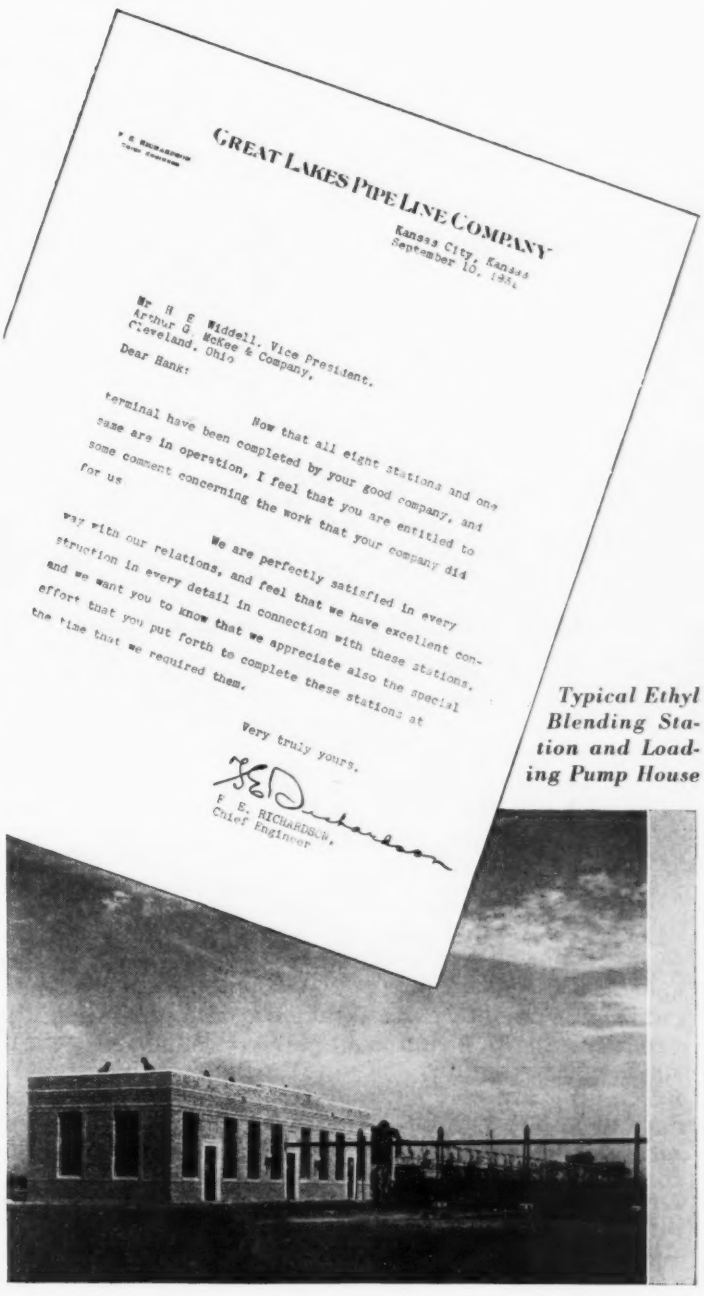
Motor Room in Electrified Station at Des Moines

PIPE LINE IN THE WORLD

COMPLETION of the 1400-mile gasoline pipe line of the Great Lakes Pipe Line Company from Ponca City, Oklahoma, to Chicago via Barnsdall, Kansas City, Des Moines and to the Twin Cities has written a new chapter in the history of gasoline transportation.

This gasoline pipe line, the longest in the world, was constructed and operating in 12 months after the surveying work was started in the summer of 1930.

Arthur G. McKee & Company's part in the building of this project included complete construction of all pumping stations, installation of equipment, piping at tank farms and all manifolds, from Des Moines east to Chicago and north to St. Paul. . . . Terminal facilities were constructed by Arthur G. McKee & Company at Des Moines, including pumping station, ethyl blending station, loading racks and tank farm.



GREAT LAKES PIPE LINE COMPANY

Kansas City, Kansas
September 10, 1931

Mr. H. E. Riddell, Vice President,
Arthur G. McKee & Company,
Cleveland, Ohio

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We are perfectly satisfied in every way with our relations, and feel that we have excellent construction in every detail in connection with these stations, and we want you to know that we appreciate also the special effort that you put forth to complete these stations at the time that we required them.

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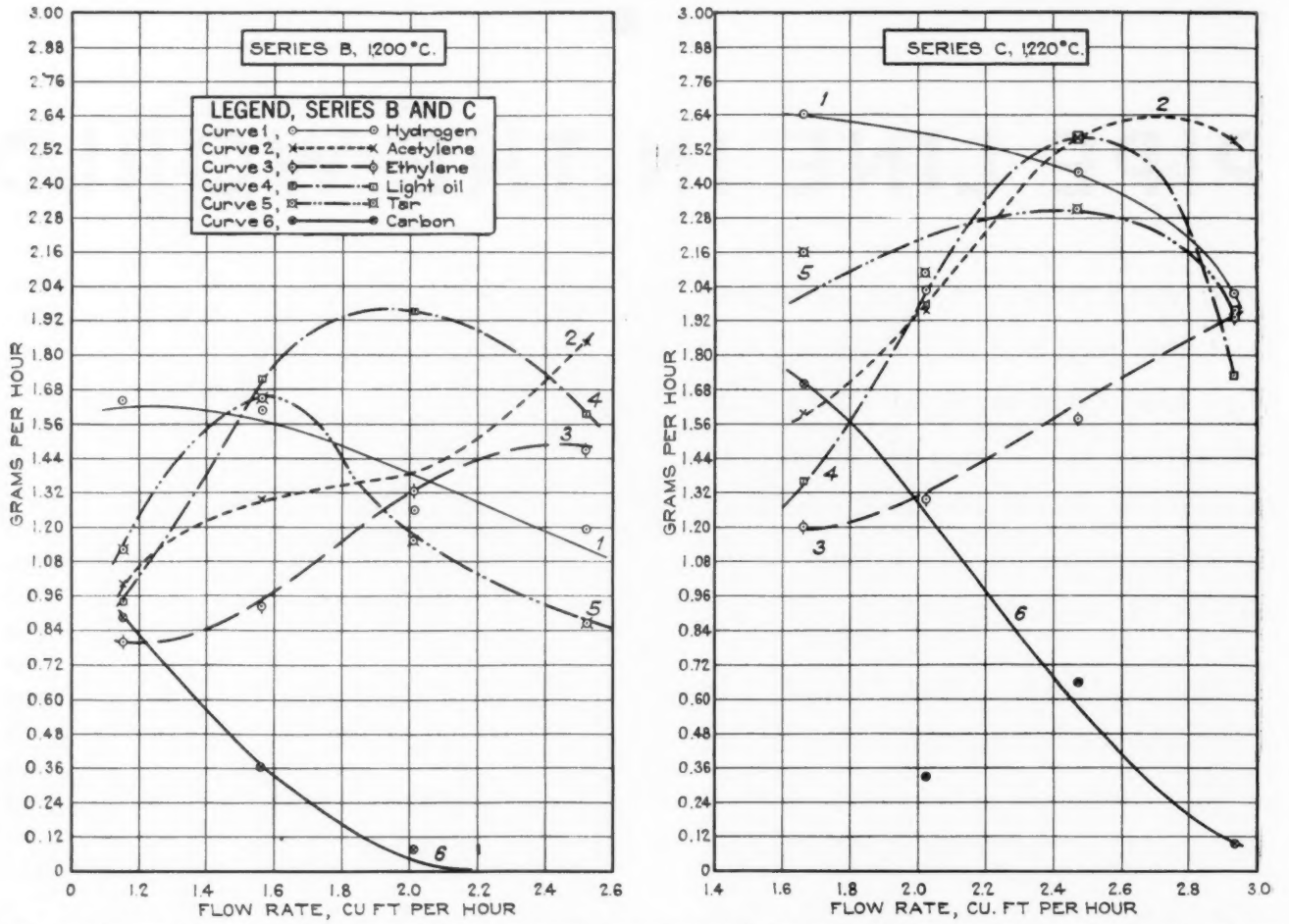


Fig. 3—Curves from pyrolysis of methane at several flow rates and two temperatures, showing yield of each product in grams per hour

and 1220°C., and then decreases.

Series B and C, Constant Temperatures

Figure 3 presents similar curves for series B and C (Table 2) at 1200°C. and 1220°C., respectively. At 1200°C. and 2 cubic feet per hour the light oil produced in unit time, curve 4, reaches a maximum. A similar maximum for tar, curve 5, occurs at about 1½ cubic feet per hour. The rate of formation for acetylene, curve 2, increases with flow rate, while that for ethylene, curve 3, tends to reach a maximum at 2½ cubic feet per hour. Hydrogen and carbon, curves 1 and 6, respectively, decrease with increase in velocity.

At 1220°C. the maximum rate of production for light oil and tar, curves 4 and 5, are both obtained in the vicinity of 2.4 cubic feet per hour. At this temperature the formation of acetylene, curve 2, reaches a maximum of 2.7 cubic feet per hour, while ethylene formation, curve 3, continues to increase with increase in velocity. The curves for hydrogen and carbon, 1 and 6, show the same characteristics as at 1200°C.

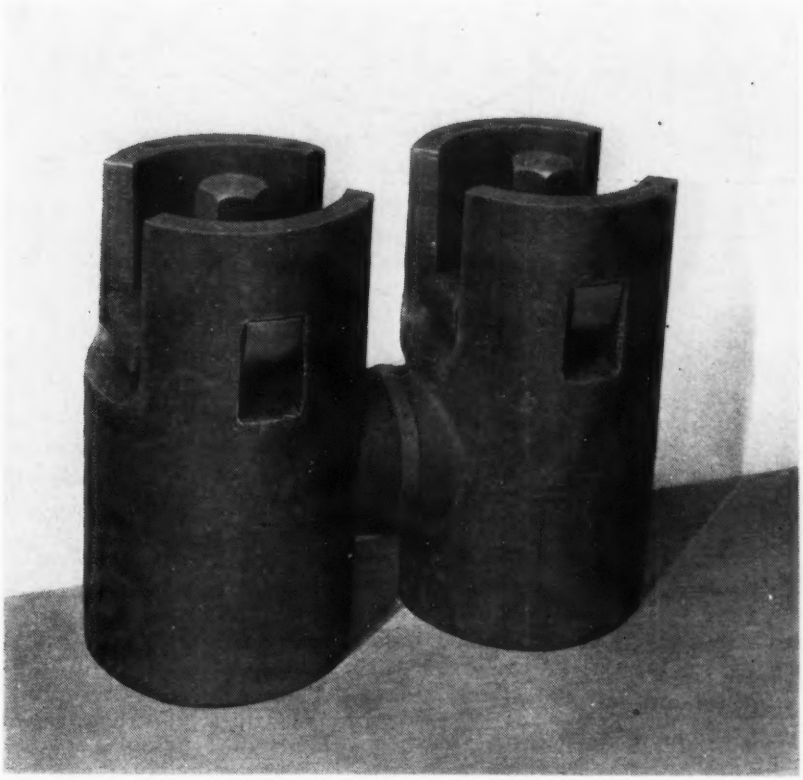
The yield in grams per hour is not the whole story, however. The yield by weight per unit volume of throughput is also of much importance. In order to help visualize the relation between yield (expressed in grams per cubic foot), temperature and flow rates, isometric figures have been drawn for the light oil, ethylene, and acetylene yields.

Figure 4 shows such a drawing for the light oil as viewed from above the horizontal plane and in the direction of decreasing temperature and flow rates. It is evident that the yield at constant velocity reaches a maximum value, as was indicated in Figure 3, and the results at 1200° and 1220° also show that maximum yields in these two planes have been attained; the highest yield was in the 1200°C. plane. However, this figure indicates that the optimum conditions for the particular set-up in question may not have been reached, because there is no way of telling from the present data that the maximum possible yield is that which has been obtained at 1200°C. and about 1½ cubic feet per hour.

It is hoped that subsequent data will make it possible to plot other points on the curves in the vicinity of the maximum yields and thus give a true picture of the best conditions for the particular tube and furnace used. Furthermore, several series of experiments with different tubes should go a long way toward establishing the best size and type of reaction tube to use for a given gas, besides indicating the best conditions for that tube. In a commercial installation both the cost of the gas and the operating costs necessarily would receive consideration. This means that the yield per unit time and yield per unit volume are both important.**

**Editor's note:—Discussion of the production of ethylene and acetylene was also included by the authors, but have here been omitted, for lack of space.

Now an Improved Return Fitting *of Forged Steel*



KELLOGG announces an improved return fitting, its design based on experience gained from actual operation of cracking plants and tube stills. ¶ Of solid forged steel construction, this new Kellogg product presents the following specific advantages which recommend its use for new equipment and for replacements.

1. The fitting is constructed of two forged steel halves, resistance welded into a single piece.
2. Use of forged steel assures uniformity of metal and makes possible unusually light weight, both of fitting body and of removable parts.
3. Badly coked plugs can be quickly loosened by means of air-driven Kellogg Removing Tool.
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5. The smallest diameter of the plug hole is larger than the outside diameter of the tube. This makes possible replacing a tube without removing any other tube.
6. The device for holding down the plug is of yoke type with self-centering set screw. This assures perfect leak-proof seating.
7. The amount of metal in fitting is sufficient so that tube holes may be machined to accommodate any type serration, or counterbored to permit the use of tube and protectors.
8. The center to center dimension of tube holes can be varied over a wide range, with close tolerances.
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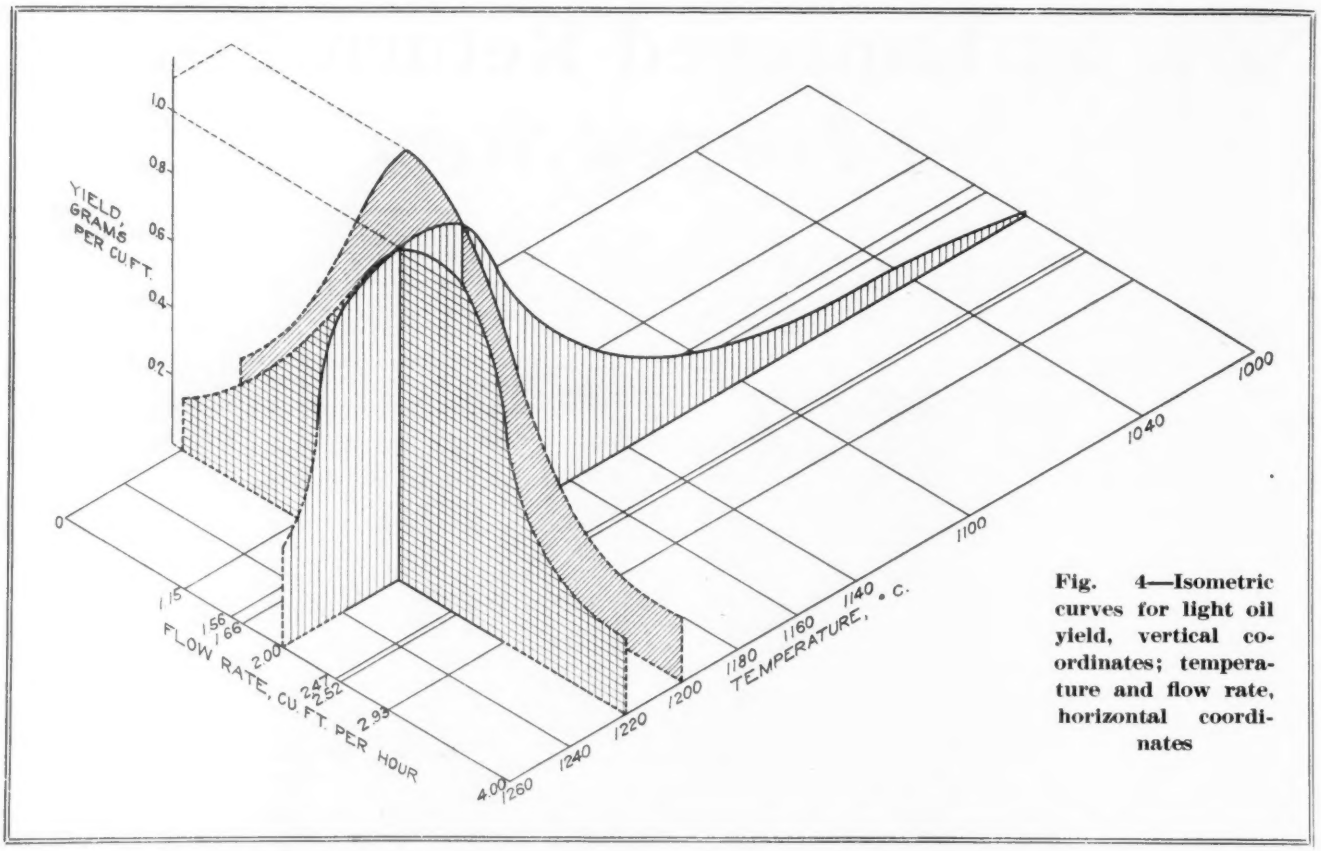

Fig. 4—Isometric curves for light oil yield, vertical coordinates; temperature and flow rate, horizontal coordinates

Experiments with Gas Mixtures

Methane from different sources may be expected to have various amounts of other gases associated with it. To determine the effect of any gases that might be present as diluents of the methane, several series of runs were made using mixtures of methane with each of the following gases: nitrogen, hydrogen and ethane. The runs were called E, F and I, and the data obtained are shown in Table 3. Both as a check on previous work and as a basis for comparison one run, D-1, was made using undiluted methane at a rate of 2.01 cubic feet per hour and at 1200 C.* The same apparauts and procedure as described for series A, B and C were used for both the comparison and the experiments with gas mixtures.

Series E, Methane-nitrogen Mixtures

Experiments were made with three different mixtures of methane and nitrogen containing respectively 3.7, 22.0 and 48.2 per cent of nitrogen. The data on these runs, E-1, E-2 and E-3 are given in Table 3. When the yield based on input hydrocarbon is considered it is evident that the formation of light oil is only slightly diminished even with mixtures of practically 50 per cent of nitrogen, whereas the yield of tar shows a marked decrease beyond 22.0 per cent of nitrogen.

When the exit gases are considered, it is seen that within experimental error the ethylene and acetylene yields are the same as for the normal run; but the amount of hydrogen is somewhat lower even for a mixture containing only 3.7 per cent of nitrogen, and decreases still more at the 48.2 per cent point. Carbon was not determined, as the appearance of the tar indicated that it was almost entirely absent.

Series F, Methane-hydrogen Mixtures

The data for the runs with mixtures of methane and hydrogen, F-1, F-2, and F-3, containing 11.1, 22.8 and 51.5 per cent of hydrogen respectively, are given in Table 3. The yields of reaction products based on input hydrocarbons, exhibit considerable differences from those of the nitrogen mixtures. The light-oil yield decreases rapidly with increase in hydrogen content, and in a similar manner but even more pronouncedly the tar yield likewise decreases. Among the exit gases the values for the acetylene show a slight tendency to increase, while the ethylene values remain normal. The hydrogen formed is much below normal. Carbon was not determined, as the appearance of the tar indicated that almost none was present.

Some interesting facts are noticed when the distribution of the various products among the total is considered. Although the total products with both nitrogen and hydrogen are below normal expectancy, it will be noticed that with nitrogen dilution the proportions of light oil, ethylene and acetylene have increased. Presumably this increase was attained at the expense of tar formation which has decreased. The per cent hydrogen shows little change.

When the distribution obtained with hydrogen dilution is compared with that of nitrogen, considerable difference is found. The formation of light oil has decreased, along with hydrogen and tar. Ethylene and acetylene yields have increased, but

*In the discussion which follows the yields from this run will be considered "normal" and representative of normal expectancy.

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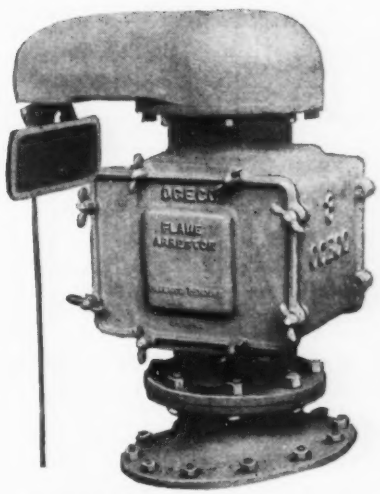

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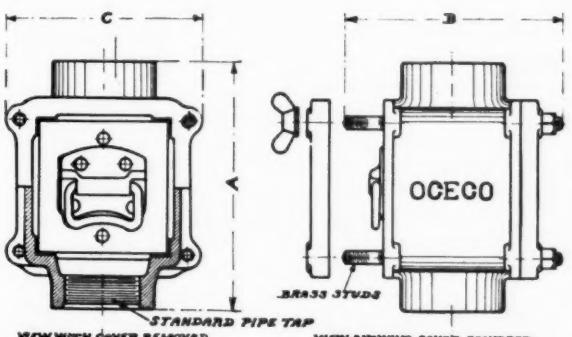

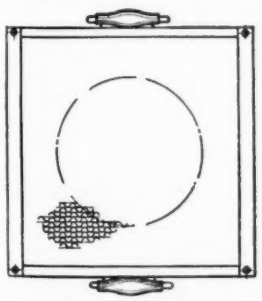

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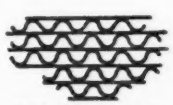

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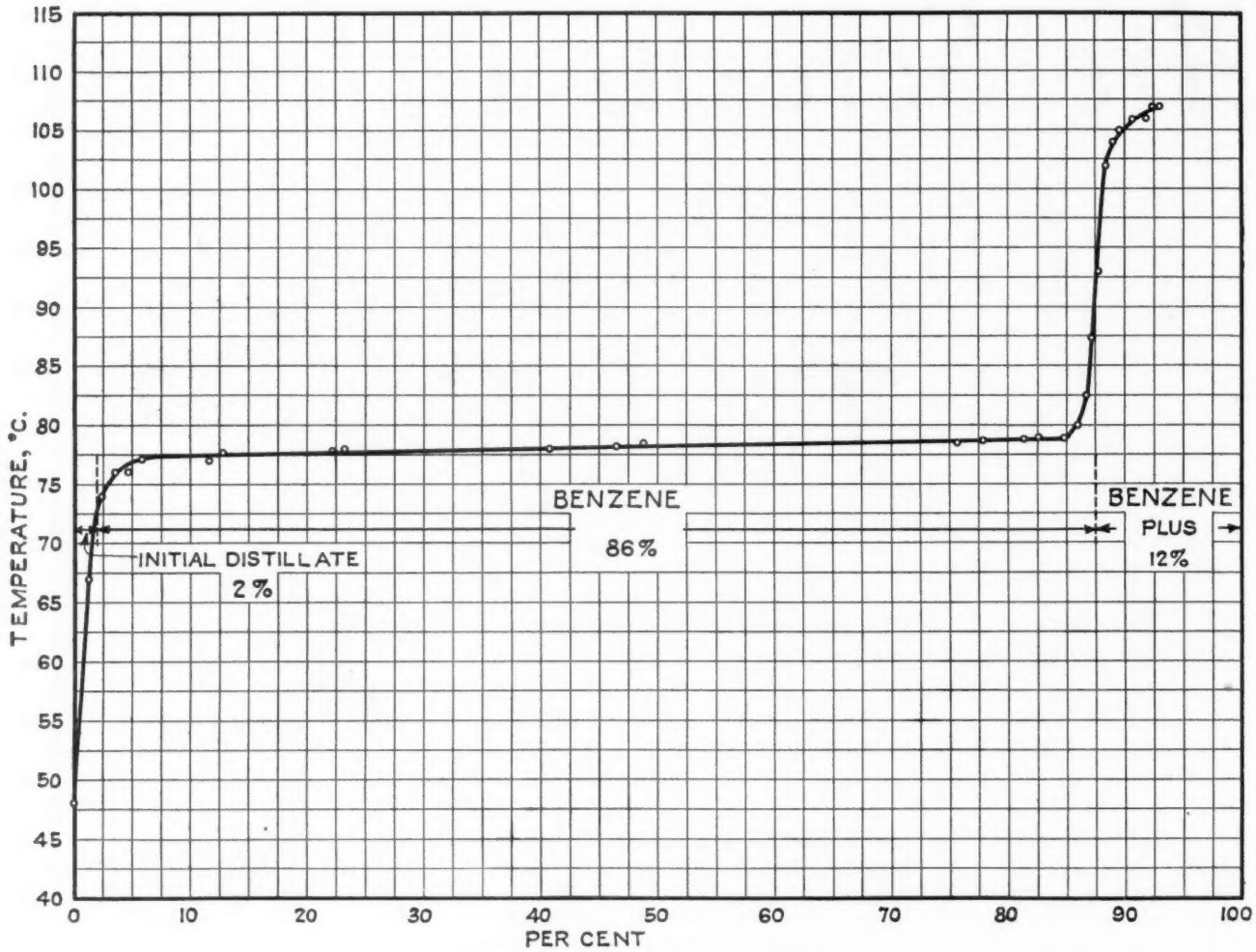

Fig. 5—Distillation analysis of light oils

not appreciably if compared to the increase obtained with nitrogen dilution.

It would appear that hydrogen and nitrogen dilution of methane may result in two effects: one, a dilution effect obtained with both nitrogen and hydrogen, which reduces the polymerization of the ethylene and acetylene, and causes larger amounts of these hydrocarbons to appear in exist gas; two, an effect probably characteristic of hydrogen only, which inhibits the transient equilibrium that exists between the methane and its initial decomposition products. This reduces the formation of all products.

Series I, Methane-ethane Mixtures

Two runs were made using methane-ethane mixtures. I-1 contained 4.4 per cent ethane, and 1-2, 14.7 per cent. The last two items in Table 3 show the light oil and tar yields and indicate a large increase with the addition of ethane. In the run

TABLE 3—Data Obtained from

Run No.	Inlet Gas										Wght. of Hydrocarbons	Furnace Temperature	Exit Gas		Volume Increase	Non-gaseous Products				
	Flow Rate per hour		Total Volume S.T.P.		Nitrogen	Hydrogen	Ethane		Methane				Total Volume S.T.P.			Light Oil			Tar	
	Cu. Ft.	Lit.	Cu. Ft.	Liters	Vol. Per cent	Vol. Per cent	Vol. Per cent	Gra.	Vol. Per cent	Gra.	Gra.	°C.	Cu. Ft.	Lit.	Per cent	Gra.	Wght. Per cent	Gal. per 1000 cu. ft.	Gra.	Wght. per cent
D-1	2.01	57.0	8.27	234.0	0.0	0.0	1.1	3.4	98.9	166.0	169.4	1200	9.52	269.4	15.1	8.19	4.83	0.298	6.88	4.06
E-1	2.03	57.4	8.10	229.4	3.7	0.0	1.0	3.1	95.3	156.6	159.7	1200	9.20	260.5	13.6	7.30	4.57	0.271	5.75	3.60
E-2	1.93	54.6	6.89	195.0	22.0	0.0	0.8	2.1	77.2	108.0	110.1	1200	7.95	225.0	15.4	5.56	5.05	0.242	3.97	3.93
E-3	2.07	58.6	7.68	217.4	48.2	0.0	0.6	1.8	51.2	79.8	81.6	1200	8.26	234.0	7.6	3.67	4.50	0.143	1.10	1.35
F-1	2.01	57.0	7.96	225.2	0.0	11.1	0.9	2.8	88.0	142.2	145.0	1200	8.76	248.2	10.1	4.59	3.17	0.173	2.07	1.43
F-2	2.02	57.2	7.85	222.0	0.0	22.8	0.8	2.4	76.4	121.0	123.4	1200	8.53	241.4	8.7	3.25	2.63	0.124	0.86	0.70
F-3	2.04	57.8	7.53	213.0	0.0	51.5	0.5	1.4	48.0	73.4	74.8	1200	7.85	222.0	4.3	0.36	0.48	0.014	0.13	0.17
I-1	2.03	57.4	5.75	162.8	0.0	0.0	4.4	9.8	95.6	111.6	121.4	1200	6.88	194.8	19.8	6.53	5.39	0.341	5.80	4.79
I-2	1.96	55.6	1.48	42.0	0.0	0.0	14.7	8.4	86.3	25.8	34.2	1200	1.95	55.2	31.5	3.70	10.86	0.748	2.54	7.46

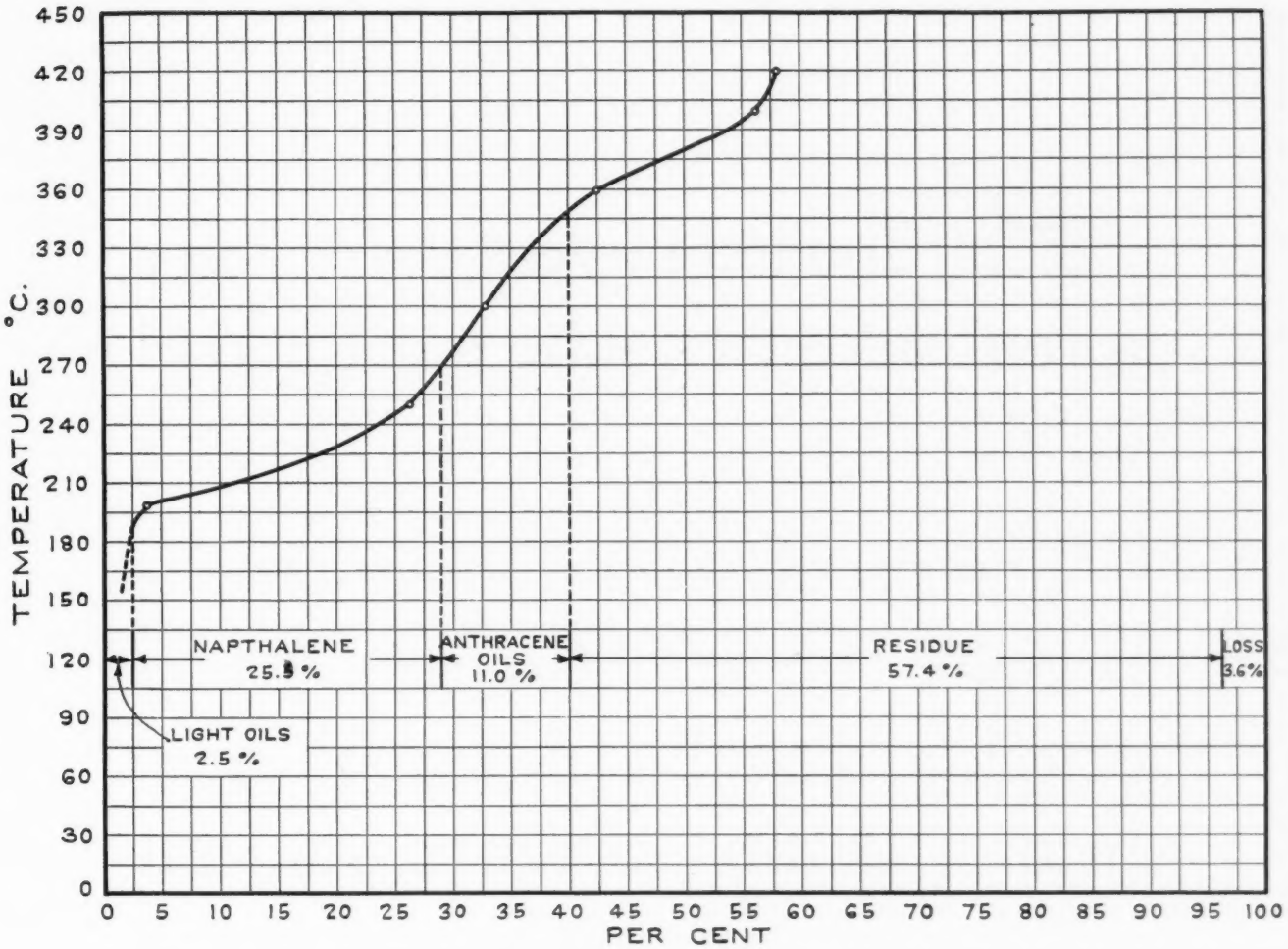

Fig. 6—Distillation analysis of tar

containing 14.7 per cent ethane, this increase amounts to about 250 per cent. The acetylene and ethylene values also have increased and definitely moved above the almost constant values of the other runs. The per cent hydrogen has increased materially, in accordance with the increase in light oil and tar. When the composition of the total products is compared with that of the reference run an increase in the proportions of light oil and carbon is found, with decreases in the values for all the remaining products.

Condensable Products

Light Oil; the combined yield of light oil from all the methane runs was fractionated once in a small column. Figure 5 shows the distillation curve obtained and indicates that the light oil contains about 86 per cent benzene, with 2 per cent of liquid distilling below 73°C., probably consisting partly of unsaturated hydrocarbons. No attempt was made to measure "loss" or "res-

Pyrolysis of Gas Mixtures

Non-gaseous Products		Light Oil-Tar Ratio	Duration of Run	Exit Gas Analysis																Difference	Total Products Produced	
Carbon				Nitrogen			Hydrogen			Acetylene			Ethylene			Methane					
Gra.	Wght. per cent		Hrs.	Vol. per cent	Gra.	Wght. per cent	Vol. per cent	Gra.	Wght. per cent	Vol. per cent	Gra.	Wght. per cent	Vol. per cent	Gra.	Wght. per cent	Vol. per cent	Gra.	Wght. per cent	Vol. per cent	Gra.	Wght. per cent
0.63	0.37	1.2	4.4	....	....	....	27.9	6.75	3.97	2.28	7.20	4.25	1.92	6.52	3.85	66.3	127.5	75.3	1.60	36.17	21.35
....	....	1.3	4.3	3.7	....	....	23.6	5.62	3.46	2.06	6.30	3.95	1.86	6.12	3.83	68.0	127.0	79.5	0.78	30.99	19.42
....	....	1.4	3.9	19.7	....	....	19.8	4.00	3.63	1.62	4.28	3.89	1.58	4.47	4.12	57.0	91.8	83.4	0.30	22.28	26.20
....	....	3.3	4.0	44.4	....	....	10.4	2.18	2.67	1.24	3.40	4.16	0.94	2.77	3.40	41.7	70.0	85.8	1.72	13.12	16.08
....	....	2.2	4.3	....	....	....	25.6	3.46	2.80	2.03	5.91	4.08	1.56	4.87	3.36	69.1	123.0	84.9	1.71	20.90	14.48
....	....	3.8	4.3	....	....	....	32.9	2.58	2.09	1.90	5.38	4.36	1.46	4.44	3.60	62.1	107.5	87.2	1.64	16.51	13.38
....	....	2.8	4.1	....	....	....	52.5	0.62	0.83	1.34	3.50	4.67	0.98	2.74	3.66	44.3	70.4	94.6	0.88	7.35	9.83
1.02	0.84	1.1	3.0	....	....	....	29.9	5.22	4.30	2.44	5.55	4.57	2.00	4.91	4.05	64.8	90.3	74.4	0.86	29.03	23.90
1.52	4.46	1.5	0.8	....	....	....	42.5	2.11	6.17	3.12	2.02	5.91	2.50	1.74	5.09	50.8	20.1	58.8	1.08	13.63	39.90

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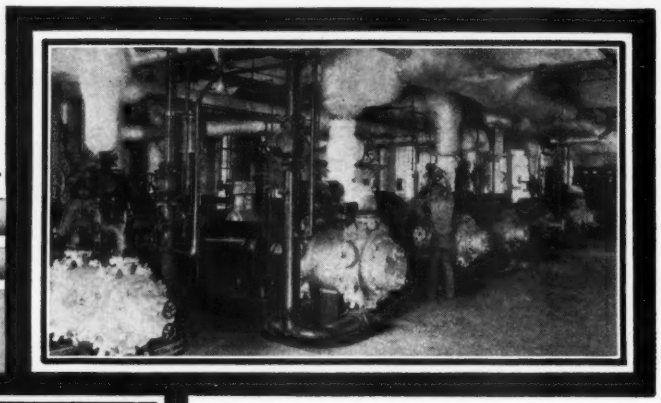

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idue"; both are included in "12 per cent benzene plus". As the distillation curve shows a break at 107°C., the presence of toluene is indicated.

Tar; a composite sample of tar from the methane runs was also distilled, and cuts were made to correspond roughly with those recommended by the U. S. Steel Corp.[7] for the distillation analysis of tars. Figure 6 shows the curve obtained and composition according to temperature cuts by this method. The fractions actually made are indicated by points on the curve, and some data for them are given in Table 4. All these cuts were solid at room temperature, although the first two contained small quantities of an oily liquid.

The identification of the constituents of this tar was not considered a direct part of the problem. Nevertheless, a few crystallizations of the above cuts were made using alcohol as the solvent. Besides naphthalene, anthracene and pyrene were identified.

[7]Methods of the chemists of the U. S. Steel Corporation for the sampling and analysis of coal, coke and by-products. Third Edition, Carnegie Steel Company, Pittsburgh, 1929. Page 260.

Table 4

Tar Fractions as Obtained by Distillation

Cut	Temperature, °C.	Per cent by weight	Color of cut
1	0-200	3.9	Dirty Grey
2	200-250	21.3	Grey
3	250-300	7.7	Yellow-Gray
4	300-360	9.5	Yellow
5	360-400	13.7	Orange
6	400-420	1.9	Orange
	Residue	38.4	Black
	Loss	3.6	

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(Continued on Page 131)

ADVERTISING PAGES REMOVED

Bitumen Hydrogenation, Gas Pyrolysis Accomplished by Canadian Chemists

CONVERSION of 80 to 85 per cent of Alberta bituminous material to gasoline by catalytic hydrogenation, without the formation of coke, appears probable from the results of recent experimental work carried out by Dr. E. H. Boomer and his associates of the University of Alberta. Pyrolytic decomposition of natural gas to produce aromatic and other liquid hydrocarbons has shown in extensive experiments that a yield of approximately 0.66 gallons of oil per 1000 cubic feet of gas, of which about half is light oil, chiefly benzene, and the remainder heavy hydrocarbons of the coal tar type, such as naphthalene, chrysene, anthracene and homologues.

Realizing that successful hydrogenation methods are dependent on a constant and cheap supply of hydrogen from dependable source, and that hydrogen can be produced economically from natural gas, Dr. Boomer undertook these studies in 1929, to develop uses for the gas and bituminous deposits found in western Canada. Five years ago the daily average possible production of dry gas in western Canada was estimated at 400,000,000 cubic feet. Large deposits of bitumen are found near Ft. McMurray and in other localities.

Proximity of these two raw materials to each other would simplify their utilization for hydrogenation of the bitumen and for pyrolytic conversion of the natural gas to motor fuel hydrocarbons. The Research Council of Alberta province has undertaken an exhaustive series of researches to determine the best means of utilizing these raw materials.

After some smaller experimental efforts, valuable mainly in determining the major limits of the conditions of study, and the mechanical difficulties to be overcome, a two-liter autoclave was constructed for continuing the work.

The first experiments were carried out on 1200-gram samples of bitumen and such charges were found to be unsatisfactory in leaving too small a volume for the gas phase and in thus delaying hydrogenation. These experiments showed, however, a great improvement over the results obtained with the original small autoclave. At 400° C. coke formation was slight, or absent altogether, as compared with 10 to 20 per cent produced previously. The gasoline yield, however, was lower, averaging about 25 per cent of the autoclave oil.

STRONG efforts are being made by Canadian authorities to develop uses for the natural gas, petroleum and bitumen deposits found within Canadian provinces.

As high as 0.66 gallons of oils, light and heavy, have been produced from Turner Valley natural gas by heating in tubes to 1000-1100 C., representing a 17 per cent yield on the basis of available carbon. Experiments are continuing to improve operating conditions to increase yields. Catalysts are being studied.

Conversion of more than 50 per cent of Alberta natural bitumen to hydrocarbons of the gasoline range has been accomplished and details of optimum operating conditions are being worked out, according to the chemist's report.

Smaller quantities of bitumen, 700 grams and 900 grams, were used in succeeding work. They were more satisfactory in allowing very rapid hydrogenation and producing a lower maximum pressure. The coke formation appears to be less.

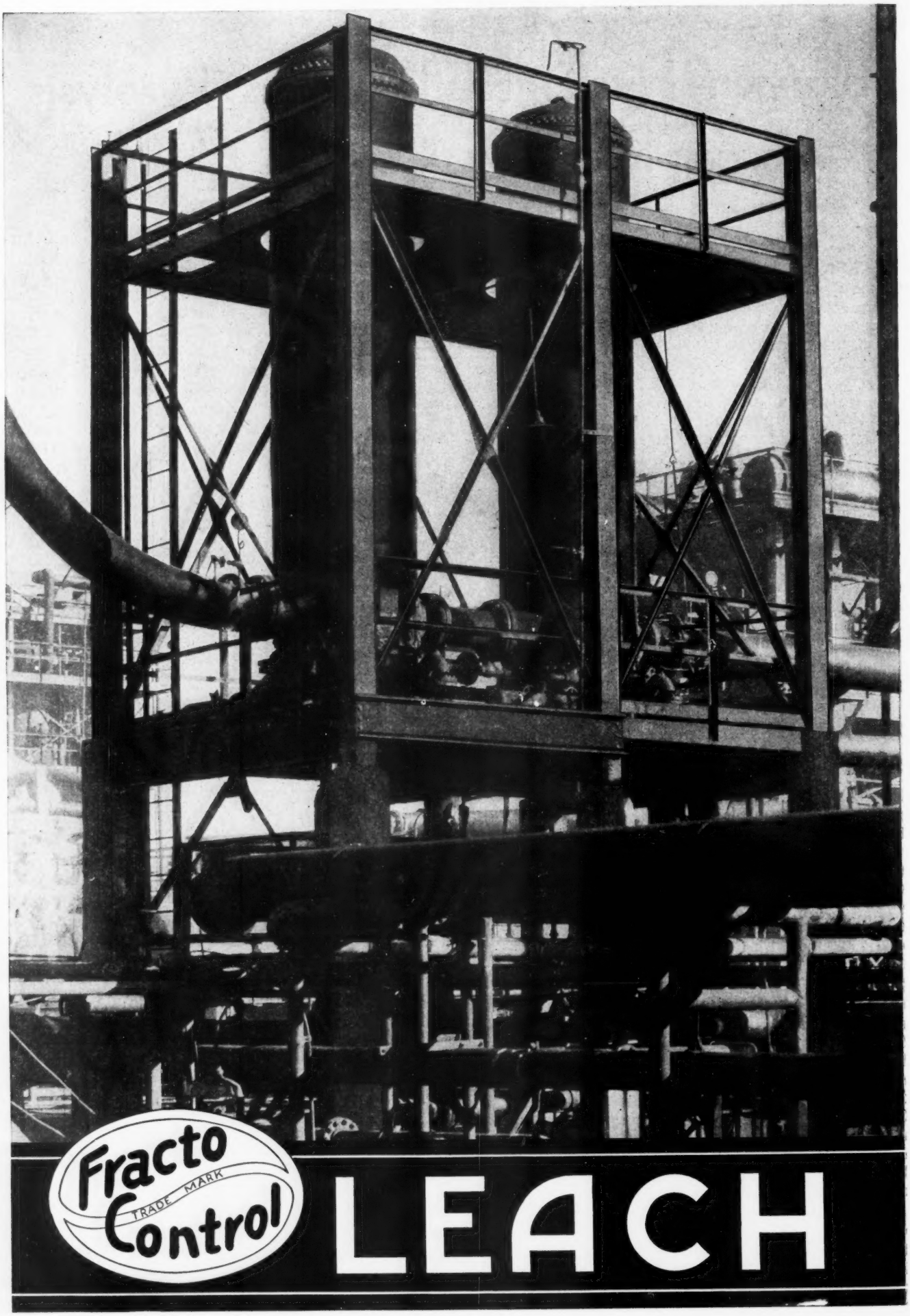
A series of experiments using ammonium molybdate as catalyst showed little improvement over those experiments without added catalysts. It is considered hardly worth while to use a catalyst with bitumen. Ammonia is known to have a catalytic effect, even in the absence of molybdenum, and the nitrogen compounds of bitumen yield ammonia by hydrogenation.

The gasoline yield from the autoclave oil increases with rising temperature, reaching 50 per cent at 450°C., but the coke production increases simultaneously to 20 per cent. The gasoline yield after refining amounts to 35 to 40 per cent of the original bitumen. These gasoline yields are minimum values.

In nearly all the experiments an exact balance between the weight of bitumen and the weight of products is not obtained. There are two major sources of loss, failure to collect all of the oil and coke produced, and evaporation losses from the oil. This latter loss is the greater of the two and consists of the more volatile portions of the oil. Some 2 to 3 per cent volatile products boiling from 30°C. to 50°C. can be condensed from the gas produced in the autoclave. The results of typical experiments are shown in Table I.

Experiments 60 and 61 used ammonium molydate as catalyst. Experiment 72 was on the hydrogenation of a pitch residue and 87 and 88 were on oil residues. In experiments 60 to 74 inclusive, three or more successive hydrogenations were carried out on the autoclave charge. The rate and amount of hydrogen absorption decreased with each successive run and the total hydrogen absorbed is not greatly in excess of that absorbed in the initial run. It is appjarent that 400°C. to 425°C. is the best temperature range in these batch experiments. The autoclave should not be more than half full in order that hydrogen be available in sufficient quantity.

The residual oil after remov-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al of the gasoline from the autoclave oil may be hydrogenated with further production of gasoline. Experiments 87 and 88 were carried out on such oil. The autoclave oils produced in 87 and 88 show smaller gasoline yields but no coke formation. They are of interest in containing a large fraction of heat stable lubricating oil stock. Experiment 72 was carried out on a soft pitch residue yielded by autoclave oil after vacuum distillation to 250°C. The gasoline yield is low and the residual oil is quite fluid. It would serve as a cracking stock or fuel oil. This residual product, the end of two hydrogenations and distillations, amounts to one-sixth of the original bitumen. It could be treated further with hydrogen at higher temperatures and reduced to gasoline and coke, but for practical purposes this residue may be considered a final product and good only for cracking or fuel.

These experiments on residual oils after gasoline distillation indicate the possibilities of continuous hydrogenation and distillation. Conversion in one operation of 80 to 85 per cent of the bitumen to gasoline, without coke formation, appears probable. A larger autoclave designed for this purpose is in construction.

In this connection, a number of experiments were performed at 425°C. on 900 gm. charges of bitumen in which the hydrogen was diluted with Viking gas.* These experiments had for their object the determination of the minimum hydrogen concentration at which hydrogenation would proceed satisfactorily. It was found the hydrogenation became appreciable only at hydrogen concentrations above 50 per cent by volume and satisfactory performance is only possible at concentrations considerably above this figure.

From the results obtained, several conclusions are evident in regard to the hydrogenation of Fort McMurray bitumen.

That hydrogenation of the larger part of the bitumen proceeds with ease and commences at comparatively low temperatures has been demonstrated. Further, the rate of hydrogenation is very dependent on the temperature, the presence of a catalyst, and the previous extent of hydrogenation. Reaction commences slowly at 200°C. and increases in rate with rising temperature. The presence of molybdic anhydride doubled, approximately, the rate of reaction. The extent and speed of hydrogenation decreases with successive treatments of the same lot of bitumen due to the adverse effect of an increasing proportion of simple hydrocarbons.

An increase in the relative amount of hydrogen to bitumen in the autoclave has the effect of increasing the absolute rate of reaction and the degree of hydrogenation possible in one treatment. In consequence of the shorter time required, coke formation is largely suppressed.

The optimum temperature for use in a static apparatus is not less than 425°C. nor more than 450°C. Rapid hydrogenation and little coke formation occur in this temperature range.

Experiments on distillation residues from hydrogenated bitumen reveal the presence in this bitumen of a small and very stable asphaltic fraction. This material has not been hydrogenated without excessive coke formation, but the problem does not appear to be insoluble.

The occurrence of two coexistent equilibria has been assumed in an attempt to account for the course of the reactions in the autoclave. One reaction is between bitumen and hydrogen, and the products of hydrogenation. The other is between bitumen and gaseous hydrocarbons, and the products of cracking. An increasing temperature favors the latter reaction more than the former. Careful temperature control is essential in the prevention of coke formation through the second reaction.

The mechanism of the reaction of hydrogen with the bitumen would seem to consist of an addition of hydrogen to the unsaturated linkages produced by thermal decomposition of the complex carbonaceous materials.

Natural Gas Pyrolysis

In the pyrolytic decomposition of natural gas from Viking and Turner Valley fields the gas was heated to 950-1100°C. in a combustion furnace, collecting the tar and heavy products in settling chambers, precipitating the tar mist electrically, and absorbing the volatile hydrocarbons in activated carbon.

One interesting observation made during the study is that the material of the heater tube has little effect on the reaction,

*Natural Gas.

Table 1

Hydrogenation of Bitumen

Experiment Number	60	61	68	72	73	74	83	85	86	87	88
Charge, grams	1200	1200	900	1200	900	915	910	710	710	925	725
Temperature, °C.	380	400	400	400	425	425	445	440	425	420	450
Initial pressure of hydrogen, lbs. per sq. in.	1460	1460	1040	1160	1290	1160	1000	1000	1000	1000	1000
Time, hours	18	10	14	14	10	8	1	2	3	3	3
Oil as per cent of bitumen	91.4	90.5	94.6	92.0	74.5	72.2	58.4	63.5	76.2	86.3	73.9
Coke as per cent of bitumen	0.0	0.0	0.0	2.8	12.8	10.4	21.8	18.4	12.0	0.0	0.0
Gas as per cent of bitumen	1.7	1.6	2.4	1.7	3.3	7.0	3.4	4.9	4.5	2.0	4.8
Loss as per cent of bitumen	6.9	7.9	3.0	3.5	0.0	10.4	16.4	13.2	7.3	11.7	21.3
Gas yield, litres per kg. bitumen	36.4	33.2	54.3	37.1	67.0	106.5	66.5	87.3	77.3	37.6	85.0
Hydrogen absorbed, per cent by weight	1.3	1.1	1.5	1.0	1.3	1.4	0.5	0.8	1.0	0.5	0.6
Gasoline in oil—A.S.T.M. distillation—per cent	20.0	20.0	20.0	11.0	31.0	47.0	49.0	49.0	38.0	17.0	21.0
End point of distillation, °C.	310	318	363	385	343	338	340	342	314	343	357
Pitch in oil, per cent	59	59	34	41	37	24	24	19	27	36	41
Refined gasoline, based on bitumen, per cent	11.6	13.0	13.9	.....	17.9	28.2	23.4	25.6	25.1	.....	.....

ADVERTISING PAGES REMOVED

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that of the raw cracked product—and at a low cost.

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INVESTIGATE the special low-cost methods especially developed for removing paint from all oil equipment.

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so long as the tube is capable of receiving and retaining a coating of hard, scale-like graphite. For this reason especially, metal tubes are of less value than refractory tubes, as the latter hold the carbon coating better after formation, and in fact form the coating much more easily and quickly. The use of gaseous sheaths of nitrogen between the natural gas and the tube is being studied, with very interesting but as yet inconclusive results.

Using quartz tubes, the results given in Table 2 were obtained. The investigators state that in their opinion the stated time of contact of gas with the hot part of the tube is probably not more than one-tenth of the time shown in the table. It is noted that the yields of oil in gallons per 1000 cubic feet vary between 0.26 and 0.70, while varying time, temperature and rates of gas flow. The best yield shown is 0.70 gallons from Turner Valley gas from experiment.

Summarizing the results obtained*, the investigators observe: A single treatment of Viking gas can yield 0.43 gallons of oil per 1000 cubic feet of gas. Of this, 0.22 gallons is light oil and 0.21 gallons tar. Turner Valley gas will yield 0.66 gallons of oil, of which 0.36 gallons are light oil. These represent approximately a 12 per cent yield from Viking gas and a 17 per cent yield from Turner Valley gas on the basis of available carbon. Some 25 per cent of the entering natural gas is decomposed in one way or another.

The production of light oil may be increased somewhat above the figures quoted at the expense of the tar fractions. The total yield is, however, decreased as the drop in tar production is greater than the increase in light oil production. The efficiency of the process, based on natural gas decomposed, is increased. A step-wise process involving successive treatments of the same gas is indicated and will be investigated.

The light oil is of a pale yellow color and is largely benzene. Fractional distillation gave the following data:

Initial B.P.	75°C
81 per cent over	80.5°C
91.4 per cent over	112°C
93.4 per cent over	150°C
6.6 per cent residue (naphthalene)	

The tar consists largely of high boiling aromatic hydrocarbons such as occur in coal tar. Fractional distillation gave the following data:

Initial B.P.	79°C
3.5 per cent over	210°C
17.5 per cent over	235°C
31.6 per cent over	290°C
44 per cent over	345°C

Naphthalene, anthracene, chrysogene, chrysene and diphenyl methane have been identified as constituents of the tar.

*Unofficial reports from the work done by the U. S. Bureau of Mines on this problem indicate that the yields of both heavy and light oils are somewhat higher. Nothing is known of the comparability of methods of measurement, however, except that the figures given here probably refer to imperial gallons.—Editor.

Table 2

Pyrolysis of Natural Gas

No.	Temp. °C.	Flow cc./min.	Time in furnace seconds	Expansion %	Exit Gas — Unsaturateds %	Exit Gas — Hydrogen %	Exit Gas — Methane %	Yield Gals./1000 cu ft.
Viking Gas								
143	950	155	14.6	8.5	2.9	16.6	73.6	0.33
145	950	225	10.0	8.5	3.2	12.9	73.8	0.26
149	1000	420	5.4	10.3	3.2	18.6	71.5	0.36
150	1000	260	8.7	11.5	2.7	20.4	70.2	0.43
153	1050	650	4.5	12.0	3.7	25.7	63.6	0.37
155	1050	420	5.4	14.2	3.1	20.0	.....	0.45
159	1100	853	2.65	13.6	3.6	24.5	64.2	0.40
Turner Valley Gas								
a	950	158	10.9	23.8	5.6	23.8	66.0	0.60
d	1000	364	4.7	25.0	7.0	25.0	63.5	0.64
e	1050	490	3.5	27.4	5.3	33.2	56.6	0.70

ADVERTISING PAGES REMOVED

1910—Motorists in Flint, Mich., could buy their gasoline through one-gallon hand operated pumps at this early drive-in station, 21 years ago. Note the horse drawn tank wagon, and the driver filling underground storage tanks through an improvised "hose" of two funnels. Some machinery to speed selling operations would make this station efficient by today's standards, but there would be considerable doubt if this station could hold its own against the 1931 version of a drive-in service station

Intangibles in Station Obsolescence

1. Modernization of Competing Stations
2. Changes in Rural and City Highways
3. Changes in Character of Population

By E. L. Barringer
N. P. N. STAFF WRITER

CLEVELAND BRIGHT, new service station is the pride of any oil marketer. On the opening day crowds gather, possibly a band plays, and the management hopes that the station will strike its sales stride immediately.

The opening day also should be significant in the preparations for the inevitable replacement. Against this day of replacement various accounts must be set up on the books. Each month, or year, part of this station's income should be set aside for replacement in the depreciation account.

These elements that normally depreciate a station are fairly well charted. Rates are fairly well established for the various items of equipment, and the station building. It is also known about how much money will be required for operating repairs based on the volume of business handled.

Aside from these charted elements every station is faced with three intangible elements, any one of which may cut short the life of a station. They are;

1. Changes in equipment and modernization of the building of competing company stations.
2. Changes in traffic routes, both city and rural highways.
3. Changes in the character of the population in the station's natural trade area.

None of these intangible elements is within the control of any one company. And any one of them may be a greater cause of a station going down hill than the normal depreciation of equipment and building.

The first cause, that of modernization, is a style factor. It is a game that can be played by large company, small company, or dealer. One modernized station, as to equipment or building, in a trade area may call for a rebuilding program of all competing stations in that territory.

There is merchandising value in appearance of all retail stores. Oil wells, refineries and bulk plants are not so much concerned with appearance, and their depreciation and obsolescence has more to do with changes through improvements. But where the oil industry touches the public direct, as in automotive equipment and service stations, the element of appearance plays a large part in the business of the staton.

One of the large oil companies for example, had established its replacement budget for last

Middle Period—By this time the station building is the central unit of the station, with a canopy to protect the pumps. Gasoline was 10½ cents a gallon at this station in Minneapolis. Note the "Prest-O-Lite" sign, for refilling the automobile lighting plant, as this was before the storage battery era. Also the display window in the station; and the landscaping contrasted with the 1910 station. The gasoline pumps were filled by air or water pressure from underground tanks. The above ground tanks held about 50 gallons, and were equipped with a gauge glass showing the outflow of motor fuel through the wet hose. This Pure Oil Co. was owned by the Hancock brothers, and the company later sold to the present Pure Oil Co., with Chicago headquarters

year on bulk plants and service stations. Certain plants and stations were on the program for rebuilding, or replacement of equipment. The program was all set, and apparently settled for the year.

Along in the spring a division manager sent in word that one of the better stations, in a fairly large city, was in danger. On an opposite corner a competing oil company had a service station that was scheduled for rebuilding at once. The first company authorized a change in its replacement budget for the modernization of its station on this corner in order to keep in competition for business.

In another instance a small marketing company had been planning a modernization program for its main outlets in the city it served. Word came through one day that a competing company was ready to start its rebuilding program. To keep in step the first company had to work night and day, for over a ing stations less efficient. These month, to perfect its plans and start actual construction in its own rebuilding program.

Modernization of any one service station in a trade area does not actually make competare capable of serving customers as in the past, but the older station suffers in comparison, on an appearance basis, with the new station.

This modernization is not limited to gasoline stations. Note the change in grocery stores with the coming of the chains, and even chain stores vie with each other to present the most modern appearance. Not also the scrapping of office and store buildings to make way for the new.

The second point, that of changes in traffic routes, is especially pertinent now. Expenditures above normal are being made at this time by cities, and states, for road rebuilding programs to alleviate unemployment, and this is hastening the obsolescence of stations through changes in routes.

As highways, both in the cities and countries, become old and congested, the rebuilding programs take into account the changes in flow of traffic, selection of new routes to eliminate curves, dangerous railroad crossings, and to speed traffic.

Virtually every oil company has felt the effects of changes in highway locations. Possibly a city through-street has been changed only a block or so, but a station will be stranded. Cut off from patronage of through traffic, these stations must rely only on perhaps sparse neighborhood business.

One of the large independent refining-marketing companies entered one of the larger cities about a year ago. The decks were clear. The company could select the best sites available under modern traffic conditions. Yet today that company finds about 5 per cent of its stations in this city are obsolete, on the down grade, and all through changes in traffic.

Out in the country many roadside stations have been cut off, surrounded now by corn fields, or on secondary highways used only by local motorists, while through traffic speeds by a mile or so away on a new, broad highway.

In one state a main highway recently was straightened for four miles. This eliminated 27 curves—and 27 roadside stations.

Changes in highway locations are being made constantly, and each year some service stations hit the down grade for this reason. Through the depression years this movement may be accelerated by accentuated road building programs and our industry will find it necessary to sharpen its pencils, and figure how to charge off many stations and outlets.

The third change, that of shifting populations, is more noticeable in larger cities. Such changes are relatively slow, and from year to year may not receive much attention, but over a five or ten-year span new residential sections have come to full flower. Such changes can

1931—A modern station in Rockford, Ill. Development of the station has gone a long ways over 1910. This station has a washable tile exterior, floodlights, air standards, Neon sign, enclosed lubrication facilities, concrete drive, and modern gasoline dispensers. In all, a modern station of a long established marketing company, Smith Oil & Refining Co.

be watched for and anticipated by the oil company managers much better than changes in highways can be anticipated.

As residential sections of a city move out the older parts of the city become business or manufacturing districts, or a residential section that does not support many automobiles.

This tendency places a two sided problem on the marketer's desk. Possibly the good residential section of 1920 has been going down hill and these people moving out to new sub-divisions. The marketer then is faced with the problem of keeping his stations, in the 1920 good section, on a profitable basis, and also planning stations in the new sections to serve customers who have moved to the suburbs.

Stations in the older section may obtain most of their business from commercial vehicles, with some passenger cars, and appearance of the station may not be such an important factor. On the other hand, stations in the new section will call for some intensive planning to present an adequate front, in keeping with today's trends in home designs so the stations will be in harmony with the neighborhood.

Even in smaller cities, where population moves are not as abrupt as in larger cities, this trend is felt also. A marketer in a city of about 100,000 population has felt the effects, in volume of sales, through children leaving their parents' home to establish their own houses in outlying residence sections.

In such cases the marketer has noted that the character of the population remains steady. Several years ago these families had children just reaching the automobile driving age. This meant two, three and four cars for a family. As the children matured they married, and moved to homes in new sections. True, the character of the population was relatively unchanged but the three or four cars per family had shrunk to one or two cars.

There is also another angle to this shifting of population. That is when a promising new residential section falls down on its promise. A retail division manager of a major oil company had a list of over 20 stations on his desk one day last summer. These stations were in a large city. They were splendid stations, from the standpoint of their ability to serve customers, but the one word "obsolete" told the story of declining sales. The manager was seeking some means of salvaging what was left, and charging off the remainder.

One of the stations had been constructed in a real estate development that promised to blossom into a high grade residential section. A main boulevard highway had ben built, and his company selected a corner in the future retail business district. The station represented an investment of about $25,000.

The location was good, excepting that the section failed to develop. Through no fault of the oil company the station was just deadweight. Fortunately in this case the oil company was able to recover part of its investment by selling the property to a company, in another industry, that was not affected by the same obsolescence factors that

worked on the service station.

How to meet these intangible elements that make service stations obsolete before their full span of useful years is a problem to which oil marketers are now giving more consideration. In fact, the method of meeting these problems is a factor in the very existence of a company, and unless a marketer keeps in step with modern stations, located to the best advantage, he may find his business at the vanishing point.

These elements of obsolescence are not discussed here in relation to expansion of marketing territory. They deal only with the present marketing territory of a company, and how these stations can be made to produce the best results.

REPLACEMENTS in service stations, as to new equipment, new buildings, or a complete change of location, should be planned over a definite span of years. These plans, however, have to be sufficiently flexible to permit rapid changes in case some such unforeseen factor of obsolescence enters the picture as has been described earlier in this article.

One large oil company, for instance, plans replacements for its own marketing facilities for the year. Such a plan permits orderly maintenance of properties, and also allows for extra attention in a territory where a special drive is to be made for business.

Division managers of this company requisition their needs, for bulk plants and service stations, for the coming year. These needs are collected at company headquarters, analysed, and a definite program developed for the year.

Changes, of course, are made to meet special conditions that arise after the formal program is adopted.

On account of an organization's marketing properties consisting of a variety of types of outlets, such as company owned stations, leased land, leased stations, and so on, five and ten year periods are used by some marketers in planning replacements of stations.

Several marketers reported that, on a lease taken on land for five years, with an option of a five-year renewal, they estimate the life of the station over the first five years. That is an estimate on what they believe will be the life of the station, and not the rate of depreciation. In case the station is still good enough to warrant exercising the five-year renewal option, then the second five years is clear sailing.

Actual cost of the station building, and equipment to be installed, unfortunately, cannot be gauged accurately to the probable life of the outlet. Appearance of competing service stations, and particularly the appearance of business houses and residences in the neighborhood, must be considered in arriving at a balance between investment and the number of years required to make the station pay out.

Other marketers reported that on a five-and-five-year land lease they considered the life of the station as ten years in making estimates as to replacement date.

In their calculations they estimate that the land will be suitable for a station at least for ten years, or the lease would not be taken. So the original station is built on a ten-year basis, in the full expectation that the five-year renewal will be taken.

IN PLANNING replacements of service station marketers have recourse to deducting the loss on obsolescence in their federal income tax reports. What is termed by the government as normal obsolescence is covered in the reserve for depreciation.

Depreciation rates vary of course between companies and also between localities. One marketer in a mid-western state has set up a rate of 10 per cent on station equipment, 7 per cent on wood stations and 4 per cent on brick station buildings. This figure was set up by the company's accountant and the income tax bureau representative.

A study of depreciation by the Bureau of Internal Revenue, is covered in a preliminary report of January, 1931. This report lists depreciation of air compressors at 12½ per cent, marketing equipment at 6 2/3 per cent, service station pumps at 10 per cent.

OBSOLESCENCE is recognized for federal income tax purposes as being in two forms. First, normal obsolescence in the changing style of equipment and buildings, which is covered by the term depreciation in the Bureau's bulletin. In fact, the use of the word depreciation is allowed to cover normal obsolescence.

Second, there is absolute obsolescence. This is the complete wiping out of a station or piece of equipment through its having become obsolete and in need of modernization. Although the government does not allow a deduction for obsolescence excepting as it is included year after year under depreciation, yet the loss through obsolescence is permitted for deduction at the time the building or equipment actually is obsolete, and taken from service.

Service stations of course cannot escape the results of obsolescence and the consequent need of modernization. But these effects can be cushioned so that the jar of having a station wiped out of service will not be so severe. One marketer, for example, made a study of the traffic trends in his city before building a number of stations in the past few years. Although definite boulevard highway plans had not been perfected for local traffic he found there was a tendency to improve present main thoroughfares, and build new highways as connecting links so there would some day be a complete system of boulevards around the city, and leading from residential to business districts.

Local traffic, he reasoned, would logically flow from secondary streets to these boulevards. Naturally the boulevards would provide the best locations for neighborhood service stations.

This trend governed his selection for sites of four stations,

Mr. ENGINEER . . .

Let's Talk Lift Facts and Figures

Globe Auto Hoists come in Free Wheel and Roll On models. Are strongly constructed to raise all weights of cars and light trucks. An investment in Globe is a permanent investment.

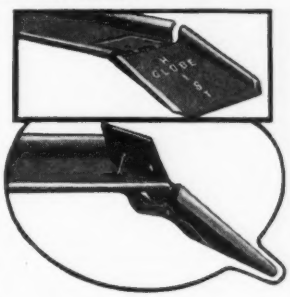
THERE are several dependable lifts on the market. You can install any of them profitably. To the efficiency-minded engineer however, it is no longer a question of *a* lift, it's a question of *which* lift.

Globe offers definite operation and maintenance economies. For example: Globe owners are raising cars of average weight on a Globe Auto Hoist with the same air pressure required by most other lifts *without a load.*

That is because *with Globe,* all the lifting pressure is concentrated at the base of the piston, and the patented "Hi-Preg" flexible cup oil seal adapts itself to the pressure exerted. In *other lifts* the lifting pressure is exerted on the sides of the piston as well as at the base, while the piston is squeezed out of oil through a packing gland at the floor level. Packing glands, of necessity, are not flexible. They must be tightened down at all times to withstand the maximum pressure exerted.

Globe's maintenance cost is also lower. The "Hi-Preg" flexible oil seal lasts longer because it contacts a machined, highly polished INNER surface, never exposed—never roughened by dirt, grit and weather. The constant tightening required by packing gland construction with resultant friction bind is eliminated.

Oil loss with Globe is reduced to a minimum for the flexible oil seal is tightened automatically according to the load. Globe requires but 25 gallons originally—10 to 20 gallons less than for packing gland lifts. And there's no constant seepage amounting to 3 to 20 gallons each year.



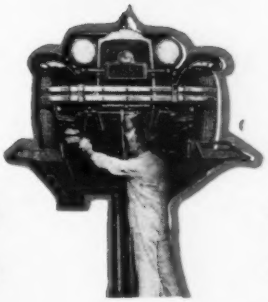
NEW
Automatic
Wheel Stop

Insert shows Globe Deluxe Roll On superstructure with positive acting FULLY AUTOMATIC wheel stop. A time saving feature.

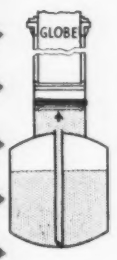
As to speed, Globe's direct lift, concentrated pressure, raises or lowers the load in 25 seconds. As to safety, the load is locked on a pillar of enclosed oil—as substantial as a cornerstone. Globe's Automatic Safety Lock is acknowledged the most positive, most efficient and most convenient.

For 12 years the "Hi-Preg" principle has proven itself superior in grain elevators through the country. For four years, an increasing number of major oil companies have turned to the Globe Auto Hoist because of its greater dependability and savings, and the fact that it is backed by Globe's nationwide Inspection Service.

Because every extra dollar saved counts as so much profit today, you will find it good business to specify Globe. Write for complete information now.



Lower Operating Cost



Globe uses less air—but 35 to 45 pounds in the tank for average cars — because the lift is direct; pressure is concentrated at the base of the piston; flexible oil seal adjusts itself to the load.

Lower Maintenance Cost

Globe's only replacement part is the flexible "Hi-Preg" oil seal. No surface of this oil seal is exposed. Friction is reduced to a minimum. Oil seal replacements come rarely. Can be attended to in 30 to 40 minutes by your attendant at low cost.

Packing Gland Troubles Eliminated

Globe's patented "Hi - Preg" construction eliminates the packing gland and its resultant leaks, friction binds, and power wastage. Globe gives you lower operating cost because it uses less air. Reduces maintenance cost because there are no oil leaks, no constant replacement of oil seal. Globe operates safely, surely and economically every day in all temperatures on every kind of a job.

GLOBE MACHINERY & SUPPLY CO.

205 W. COURT AVENUE — DES MOINES, IOWA

GLOBE *Auto* HOIST

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No. 307

Globe Machinery & Supply Co., 205 W. Court Ave., Des Moines, Iowa
Please send details of Globe Auto Hoist and "Hi-Preg," direct lift principle.

Name.....

Town..... State.....

all built recently, and his judgment was justified, as the stations have exceeded his original estimates as to the volume of business to be expected.

Another marketer keeps in close touch with county officials in his territory. State highway improvements in his state are made after consultation with county officials. This marketer's connections are exceptionally fortunate, and he knows of contemplated changes long before public announcement.

This marketer also purchased about 100 movable service station buildings several years ago. In case a location with one of these stations becomes obsolete he can salvage the entire station building, removing it to a new location, and his loss is minimized to the extent of his holding in the land.

The combination of movable station buildings, and excellent information on highway changes, stood him in good stead recently. A highway was to be changed, so this marketer selected two sites on the new road, and moved over his two stations from their old locations.

A marketer in a southern state was influential when a highway change was proposed that affected one of his stations to the extent that his additional expenditure amounted to a canopy and some pumps at what had been the back of the station. The highway was changed slightly, so the new route passed the back of the station.

A cancellation clause in leases, operative in case of highway changes, is used by one marketer to cushion obsolescence losses of this type. This means does not salvage the station, but it does relieve this marketer of continuing rental payments for a station in case the highway is changed.

Another marketer has solved part of his obsolescence problem by building his stations so they can be moved. He consulted his contractor on the idea of placing eight-inch I beams along the side foundation of the stations, extending to the supports for the canopy.

The contractor approved the idea, and said it would be possible to move the station, so the I beams are part of the company's station specifications.

The final suggestion comes from an Illinois jobber. It represents a fundamental problem in finance. In spite of its academic flavor it is sound, and this jobber is giving serious consideration to his idea.

This jobber has recognized depreciation and obsolescence of his service stations and bulk plant, and accordingly has set up an account on his books as reserve for depreciation. He has faithfully added to his reserve fund, year after year, and at a fair rate.

In spite of this bookkeeping practice he finds his cupboard bare. His books show a fund for depreciation, but he cannot find it in his bank account.

This jobber has been purchasing real estate, against the day this land would be suitable for service stations, and the practice has sapped his funds. In years of prosperity he would set up his reserve for depreciation, and take surplus funds from the bank to buy land. Now that he would like to modernize his stations he finds his bank account at low ebb.

His proposal is one of self-discipline. He proposes to set up a separate bank account for depreciation reserves, possibly in a bank other than the one carrying his regular account.

Each month, or year, he proposes to determine his amount for depreciation, write out a check against his regular account, and deposit that amount in the other bank to his savings account for replacement.

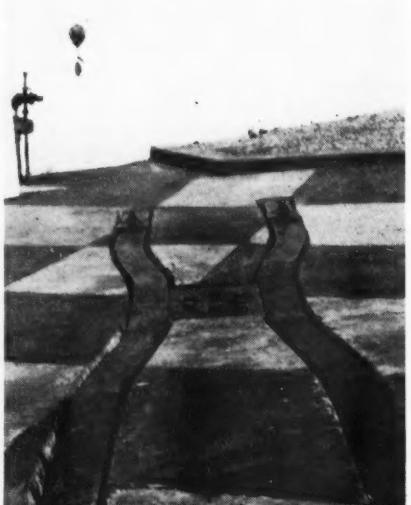
This replacement fund will be controlled by his board of directors. It will be used solely for replacement of present stations. Any new stations will have to be built out of actual surplus, or from new capital, and he will not be draining his reserves for depreciation of their actual replacement use to build new stations.

Recessed Lifts Increase Driving Space

SALT LAKE CITY—Free wheel lifts are generally used at Salt Lake City service stations. Many of the stations handle tires and free wheel lifts are convenient for tire changing.

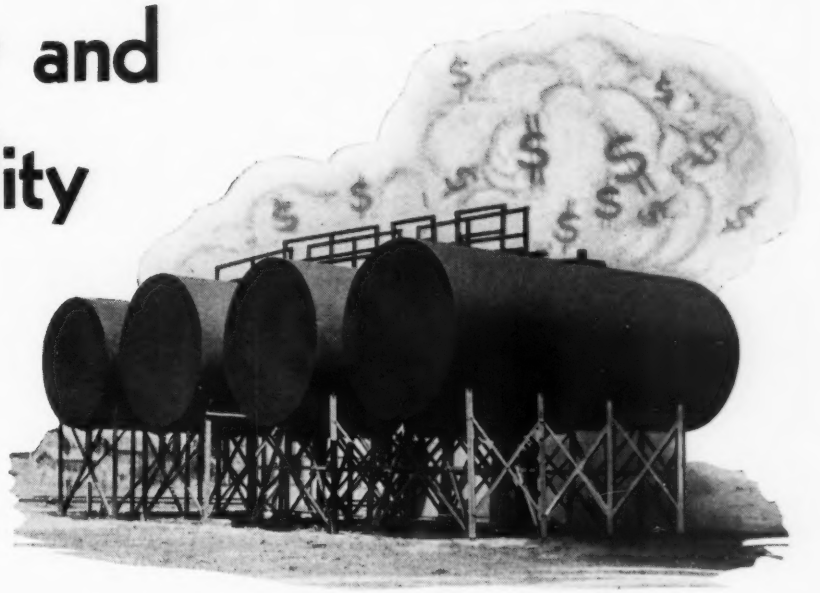
In some of the stations, built on small lots, or where it is sometimes necessary to drive cars around the space devoted to lubrication work, the lifts are recessed in the pavement. When the lifts are not in use, it is possible to drive a car over them, just as though they were not there. Controls are usually placed along a nearby wall so they will not be damaged.

The illustration shows a recessed lift at a Parco station. The controls are against the wall near the head of the lift and greasing tools and hose are kept in a cabinet to the left of the controls.



Recessed free wheel lift at a Parco station in Salt Lake City. Controls are on stucco wall back of the lift's head. Greasing tools and air pressure hose are kept out of sight when not in use in the cabinet to the left of the controls

Modernizing Bulk Plant Storage Tanks Saves Money and Protects Quality



$$ $$ $$ $$ $$ $$

CLEVELAND

EVAPORATION levies a heavy toll each year on gasoline profits at bulk plant storage. The loss is direct, financially speaking, through passing gasoline into the air that could be sold to customers; and indirect in that evaporation removes the best fractions of our motor fuel.

This loss, fortunately, may be lessened materially by modernizing gasoline storage tanks to provide adequate protection for gasoline storage, with a vapor tight tank, correctly painted and covered, equipped with pressure and vacuum relief vent and with gauging devices that enables the taking of inventory without dissipating the built up pressure.

A conservative estimate of the industry's annual evaporation bill, through inadequate storage at bulk plants is about $75,000,000.

Statistics from the Bureau of Mines indicates a domestic demand for gasoline from refineries for 1930 of 394,800,000 barrels. A study of evaporation losses by Ludwig Schmidt and C. J. Wilhelm, Bureau of Mines engineers, showed that for 4½ months in the summer of 1930 a red painted 12,000-gallon storage tank lost 3.54 per cent of its gasoline. The storage was standing over the period of the test, and the tank was equipped with 2 ounce pressure and ½ ounce vacuum relief vent.

Over a year this evaporation loss would be projected to more than 9 per cent, on 35,500,000 barrels. If we grant the marketer a gross profit of 5 cents a gallon, or $2.10 a barrel, on gasoline in his bulk plant, this loss is about $75,000,000.

There are few red, or dark painted, bulk storage tanks in the country, but an aluminum painted tank without pressure vents will evaporate more gasoline than a red painted tank equipped as in this test, in the opinion of engineers acquainted with the problem.

In theory it is possible to eliminate all evaporation loss in marketing gasoline. Mechanically the job could be done. Economically it is not feasible, as the costs of making the savings would be greater than the results.

In the same evaporation study, which will be discussed more fully later in this article, a light colored tank with an insulating housing resulted in the lowest evaporation loss, 1.40 per cent for the 4½ months. At this rate, with a 5 cent gross margin per gallon, evaporation losses would amount to about $31,000,000.

But a scaling down of these losses in bulk plant operations from $79,000,000 to $31,000,000 would be a sizeable savings in any year.

The cost of protecting storage tanks against evaporation losses is slight, in actual financing for the equipment, and especially in relation to the savings of gasoline. It has been estimated by several manufacturers of pressure and vacuum relief vents that the cost of this equipment is paid for within several months.

A vapor tight tank is a requisite for the equipment to reduce these losses. Seams, and heads of vertical tanks, should be inspected, and caulked if necessary. Leaky seams below the liquid level will show up of their own accord, and those above the level may be observed for vapors rising on warm days. All gaskets should be checked also against vapor loss.

The tank needs protection to do its full share of the work in conserving gasoline. Light colored paint is effective in reducing the temperature of the vapors above the gasoline and in lessening the breathing of the tank. A better aid is a well ventilated housing around the tanks, but this is more costly.

Results of the government evaporation study, to be taken up later, give detailed data on tank covering and on pressures.

The pressure-vacuum relief valve on the tank functions in

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keeping a given pressure on the contents. As the gasoline in the tank, and the air-vapor mixture above the liquid level, becomes warm there is an expansion that is provided for in the vent. Conversely, as the tank cools there is a shrinkage and a pressure drop within the tank.

This is the breathing of the tank. The cycle goes over the year, as the expansion in summer and contraction in winter; and also over the day, as the expansion takes place at more noticeable in summer, and the contraction after the sun goes down.

If the tank has only an open pipe evaporation losses will be great, governed then only by the temperature, sun shining on the tank, and the degree of protective paint or covering. The pressure relief valve is designed to reduce the breathing of the tank. Built up pressures, up to a predetermined limit, are kept in the tank. When the expansion of the tank's contents builds up a pressure greater than provided for in the valve this additional pressure is permitted to pass into the air. But once the pressure is reduced to the valve's limit the latter closes of its own weight.

The same is true of the vacuum relief valve, which is incorporated in the one piece of venting equipment. As the pressure within the tank decreases, as on a cool night or in withdrawing gasoline from storage, air must be admitted to prevent the building up of a vacuum and the possibilty of sucking in the sides or head of the tank.

Pressure vacuum relief valves can be designed for any pressure. The limitation of course is the strength of the tank to withstand pressure and vacuum, governed by cost of such equipment in relation to the savings involved.

A marketer has several methods of determining the correct capacity of the vents to be installed, on old storage tanks. If he is not an engineer in his own right the best local source of information on how much pressure his tanks will hold would be the city water works engineer.

The tank manufacturer also would be a good source for this information, giving the age and condition of the tanks in writing. Manufacturers of valves are helpful to the marketer in determining correct equipment.

In the government evaporation study two pressures were used. Four tanks were equipped with 2 ounce and one with a five pound pressure relief vent.

One of the larger oil companies with a well manned engineering staff working on its marketing properties equips its bulk plant tanks with vents to hold a pressure of 16 ounces, or one pound.

There is one more consideration to be given equipment for reducing evaporation losses. This is the method of taking inventory of gasoline in storage tanks in relation to evaporation.

Tradition gives our industry the sticking method, opening the gage hatch, and dropping in the stick or a tape and measuring the depth of the gasoline in inches or in gallons. This method would be quite acceptable, from an evaporation view point, as long as the tank is not vented, but once the tank is equipped to hold a pressure this method has serious limitations.

There are other considerations for mechanical gaging equipment, such an accuracy of inventory and fire hazards, but the consideration here has to do only with evaporation.

With the opening of the hatch for gaging a tank the pressure is dissipated. Vapors in the tank are released. While the hatch is open the vents are non-operative and there is only the atmospheric pressure on the gasoline.

The more often the tank is gaged with a stick the more often vapors are released. And each time vapors are released the marketer can hear the profits vanish into the air.

To conserve gasoline, and to obtain the maximum work from protective devices, the marketer should give serious attention to

his inventory methods to reduce opening of the hatches to a minimum.

Knowledge of evaporation at bulk plant storage tanks is slight, as these losses are interwoven with others in the operation of the plant.

Tank car receipts with inventory of tanks are checked against actual sales or outgoing tank truck shipments, and the difference charged to shortage or overage. It is incorrect to charge this difference to evaporation loss, which is part but not the entire loss.

There may be spills in handling the gasoline through the plant. There may be inaccuracies in gaging tanks, or the compartment figure of the tank may be off. And there is a remarkable chance for error in correcting gasoline in the plant to temperature, yet that same gasoline is sold on a volume basis and some of it has an opportunity to expand on warm days while it is being trucked along the highway.

Marketers in northern states may object to being included in

The First Step is to Put on Your Hat

THE head of the oil marketing company whose losses on gasoline are running at the rate of three or four per cent of the volume handled can likely make a sizeable saving of dollars by checking over his physical facilities for storing and transporting gasoline.

First, it might pay him to put on his hat and go outside and take a little more critical look at his gasoline storage tanks than he usually does. There is a material saving to be accomplished through using the proper paint, in color and materials, and having the painting done at proper intervals.

The U. S. Bureau of Mines, at Washington, issued a report on proper paints for crude oil storage tanks, Report of Investigations No. 2677 which would be a helpful guide to painting gasoline tanks, and the principal paint manufacturing and distributing companies of the country have carried on experiments and will give information on the subject. R. I. No. 3138 on bulk station losses shows the effect of both paints and housing on the loss from these storage tanks.

Second, he should make sure his tanks are properly caulked so there are no leaks at seams or elsewhere where vapors can escape. On a warm day the presence of such leaks can sometimes be determined with the naked eye.

Third, if the tanks are not equipped with pressure-vacuum relief valves to hold the vapors in the tanks up to a certain safe pressure, he should study the advisability of so equipping his tanks. The day of letting tanks "breathe" into the air is about over. The cost of these pressure venting devices is small. Several companies which advertise in NATIONAL PETROLEUM NEWS provide them, and their engineering departments are glad to give advice on the subject. The devices can be installed by the average mechanic. Or considering the application of such devices, the pressure the tank is built to withstand must be known or carefully estimated by competent authority.

Fourth, the marketer should determine that the gauging of the tanks is properly done and done no oftener than is necessary to keep an accurate check on inventories. Particularly with pressure vented tanks, there is a loss, every time the gauge hole is opened, of vapors which carry off the most valuable portions of the gasoline in storage. There are devices now on the market which provide for checking the contents of gasoline storage tanks withput recourse to the use of a gauge pole. Their cost is not great, considering the savings that are possible in checking vapor losses over a period of months.

To be efficient, these devices call for tight tanks as far as leaks at the seams or elsewhere are concerned. The accompanying article gives an idea of the money that can be saved for the oil company through the cutting down of evaporation losses by the installation of pressure venting devices and by other means.

Fifth, the marketer should determine if, in filling his storage tanks, the liquid is being pumped in at the top and allowed to fall into the liquid already in the tank. This has been determined an inefficient and costly method of performing this operation. The proper way is to pump in at the bottom of the tank. The change can be made without difficulty and at no particular cost, by extending the inlet line to the tank bottom.

Sixth, the gasoline should be loaded in the compartment of the trucks in the same manner, that is using an arm on the loading pipe which reaches well to the bottom of the compartment, so that the incoming gasoline enters beneath the level of liquid in the tank.

For the marketer who is without the benefit in his own company of an engineering knowledge and who deems such knowledge advisable in studying means to check evaporation losses, it has been suggested that the local water works engineer is a good source of advice, being experienced in general tankage problems. His fee would probably be small for inspection of tanks and advice on how to make them vapor tight.

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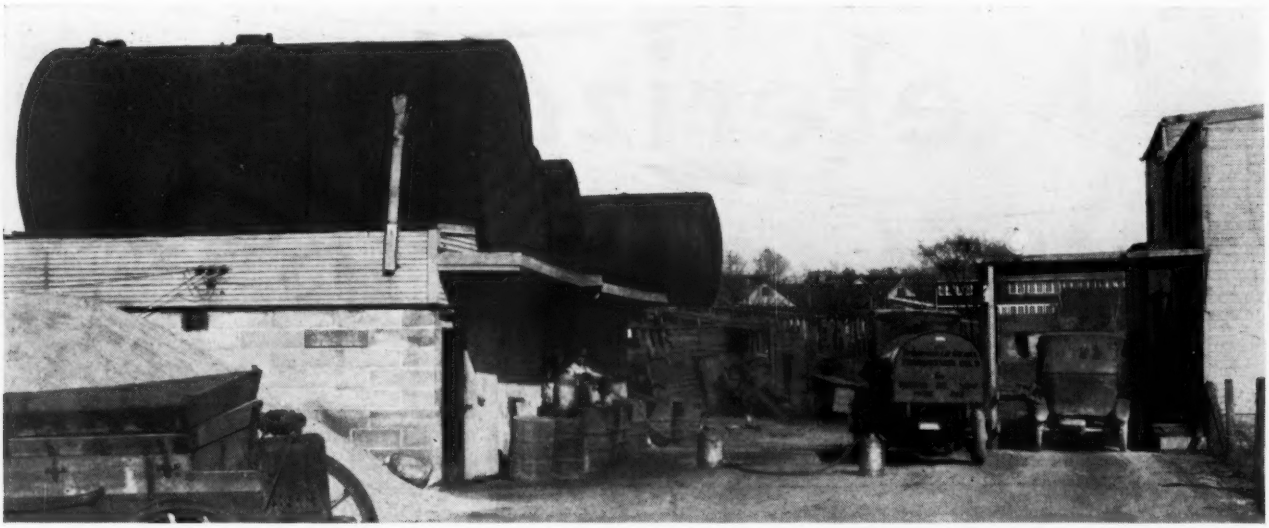


A bulk plant of the late World war period. Note the truck garage and warehouse under the storage tanks, and the congestion of the drive

the list of those having evaporation losses. With lower temperatures through the year, and fewer sunny days they may feel that the burden of evaporation is on the southern marketer.

We cite one engineer's experience in checking losses for his company's marketing properties. His company operates over many states, in all parts of the country, and at a southern bulk plant he encountered the argument of overage in warm climates, on account of temperature-volume changes on standing storage.

This bulk plant was loading tank trucks by dropping the gasoline in the top of the compartments. When the manager was questioned about this practice he defended the work by replying that his plant was always over. His bookkeeping records substantiated his point.

The engineer suggested that possibly it was not a question of shortage vs overage. Rather, it was a question of how much overage. Even if this plant was continually having overages, in spite of loading trucks from the top, possibly there was waste in not having a greater overage.

Loading of the tank trucks was changed so that gasoline was taken to the bottom of the compartment, in place of dropping it in the top. Instead of having an average overage of 1 per cent this bulk plant jumped to a 1¾ per cent overage.

A survey made by NATIONAL PETROLEUM NEWS at 21 marketers' bulk plants, all in northern states, produced a variety of estimates as to evaporation losses.

Eight marketers had no figure as to evaporation loss; some had tanks equipped with vents, and others were unvented. The smallest evaporation loss at the 21 plants was 3/10 of 1 per cent. The highest was 2 per cent.

One marketer with an estimated 2 per cent loss had no vents. Another had vents set for 8 ounce pressure, but deemed his vents too light.

In answer to one question as to the amount of evaporation loss, and how it was figured, one marketer replied that he put so much in his tanks and got so much out. Another marketer estimated his evaporation loss, with shrinkage and spillage amounted to 1½ to 1¾ per cent. He figured his loss on a day to day basis of receipts, inventory, and deliveries. Several marketers reported they made no effort to determine evaporation losses.

One marketer with 13 tanks reported a monthly loss of about 3000 gallons through his plant. His annual volume of business is about 4,000,000 gallons. 36,000 gallons per year at 8 cents equals $2880.

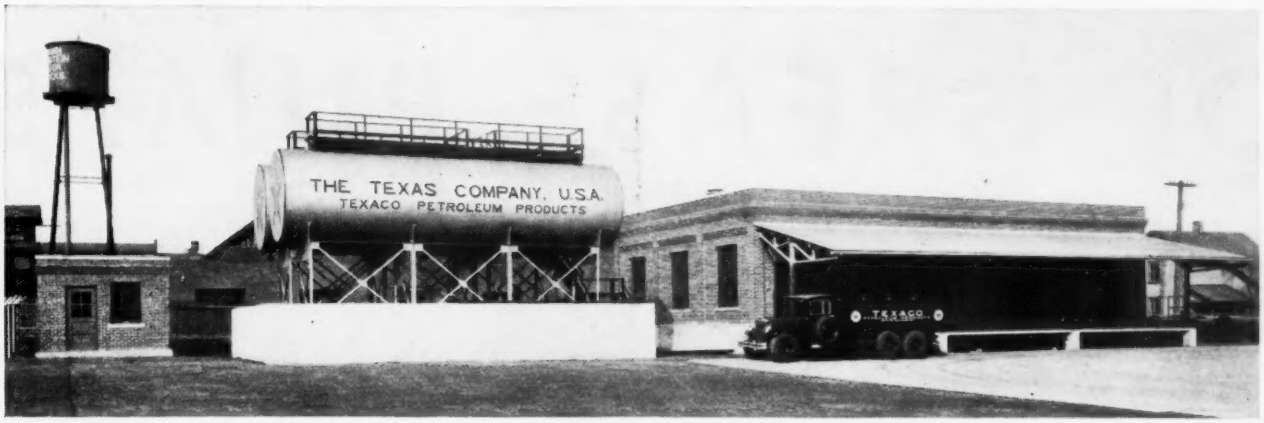
Fourteen of the 21 marketers reported having vents on their tanks. The percentage of estimated loss on vented tanks was considerably under that of the unvented tanks.

Much of our lack of knowledge on evaporation losses may be credited to the operating conditions of plants. With storage tanks being filled at irregular intervals, and gasoline being withdrawn constantly into tank trucks it is difficult for the marketer to segregate various losses.

Besides the direct loss in money through evaporation there is a loss in the quality of the gasoline sold. A manufacturer with much experience in our industry's problems relates how this loss in quality can cause great difficulty through an inspector finding gasoline being sold at the service station pump not meeting the company or state specifications.

Many arguments can be started, he points out, between manufacturing and sales departments as to what happened to the motor fuel. When it left the refinery it met specifications. When it came out of the gasoline pump hose it did not.

Evaporation along the line tells the story of higher initial boiling point, higher end point, and loss in gravity and anti-knock. Avoidance of evaporation losses, this manufacturer believes, is most vital to the



Modern bulk plant of a major oil company. Note the separate pump house, dikes around storage yard, loading dock at the warehouse and the drive

marketer to insure selling the same grade of gasoline that he advertises.

There is also the fire hazard of having gasoline vapors coming from tanks that the marketer should consider.

The most complete study of evaporation losses in gasoline marketing was undertaken in 1930 by Ludwig Schmidt, petroleum engineer, and C. J. Wilhelm, junior engineer, with the U. S. Bureau of Mines.

The following data on this subject is taken from their work, as printed in the U. S. Bureau of Mines Report of Investigations 3138 and abstracted in NATIONAL PETROLEUM NEWS, Aug. 19, 1931, page 29.

This study was to determine and compare the effects of various colors, insulations, and pressures in reducing evaporation losses. Five horizontal storage tanks, 12,000 gallons each, were observed from May 29 to Oct. 15, 1930. These tanks were erected near Kansas City, Mo.

Each tank was about 20 feet long, and 10 feet in diameter, fabricated from ¼-inch steel tank plate, and of welded construction. The tanks were set on welded supports of 2-inch angle iron. Tanks were about 30 inches off the ground, and in two rows 30 feet apart so they would not shade each other.

There was a manhole 2-feet in diameter on each tank, in the top center of the shell with connections for the vapor-tight gage hatch and the vacuum and pressure relief valve. Connections for the recording thermometer and pressure gage were at one end of the top.

One tank operated under 5 pounds pressure and had its head reinforced with two vertical braces of 2 inch angle irons welded to the interior of each head. Braces were about 18 inches from the vertical center line of the head, and extended to within an inch of the top and bottom.

"Tank A was painted with two coats of white paint, and in addition was protected with an insulated housing consisting of a corrugated composition sheet siding or roofing attached to a welded steel frame," reads the description of the tank equipped with housing.

"The corrugated sheets were made of a composition of asbestos fibre and portland cement and weighed 4.1 pounds per square foot. Roof sheets were 7 feet long, 42 inches wide, and ranged in thickness from 5/16 to 7/16 inch.

"The side sheets were of the same dimensions except for the length, which was 5 feet. Free circulation of the air between the tank and the housing was assured because the minimum clearance between the sides or roof sheets and the shell was about 11 inches.

"The ends of the tank were not housed, but lower temperatures probably would have been obtained within the tank if the ends had been protected in the same manner as the sides."

Gasoline used in the test, at the beginning, had an average gravity of about 64.8 degrees, 91 initial boiling point, 419 end point, and a 96.4 per cent recovery.

Atmospheric conditions of this period were recorded, obtained from the monthly meteorological summary published by the Kansas City station of the U. S. Weather Bureau.

The study was made with storage standing, although it was recognized that bulk plant storage tanks do not stand full usually for more than a day or two in summer months.

As the anticipated losses in some test tanks were known to be relatively small the study was made with standing storage conditions to reduce the possibility of error in determining the changes in volume by gaging.

Each tank contained about 8,000 gallons of gasoline, selected as the average working capacity of the average bulk plant tank in the summer.

At least once every two weeks the tanks were gaged with a steel tape and plumb bob. One gage was of the innage, or actual depth of the gasoline, and the other was to determine the outage, or distance from the top of the shell to the level of the liquid.

Readings were calculated separately and checked to reduce the likelihood of error. Average temperatures were taken at the time of gaging with a thief thermometer and average sam-

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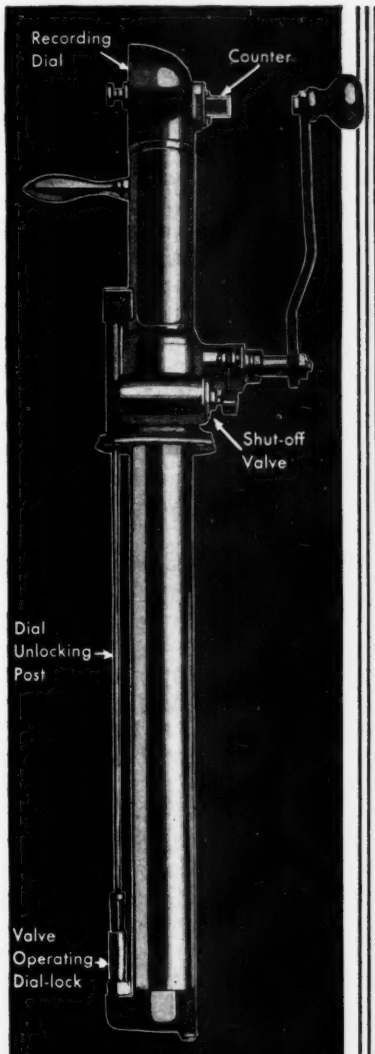
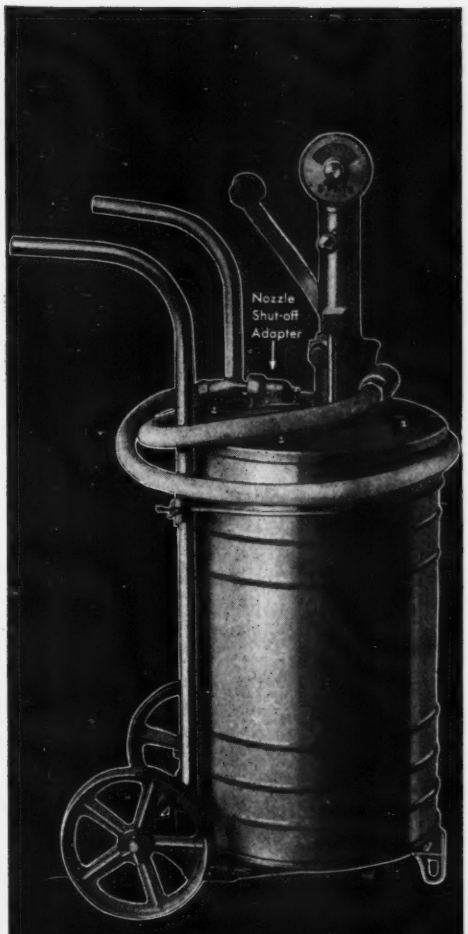
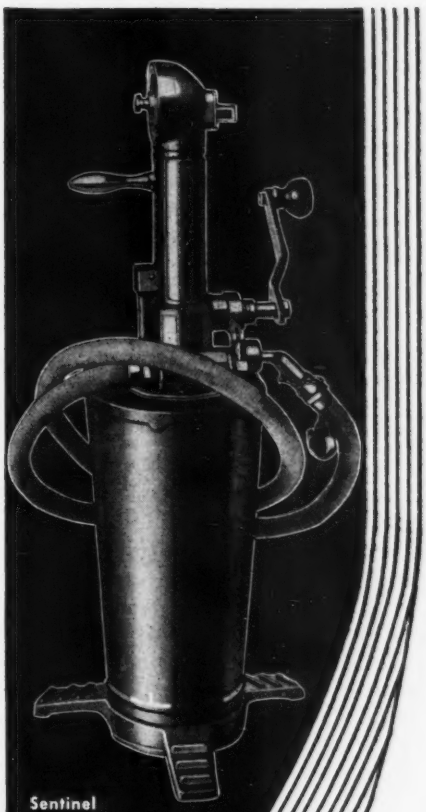


Unmounted Sentinel unit, showing by-pass valve and dial unlocking post.



Sentinel mounted on 100 lb. drum unit. Easily changed from drum to drum.



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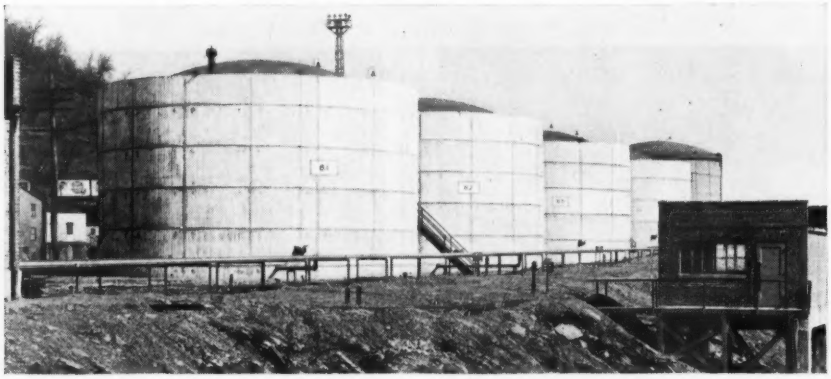

Marine storage tanks at a major oil company bulk plant on one of the inland waterways. Each tank holds 250,000 gallons. Four tanks are for gasoline and one for kerosine. The brick building at the right is pump house for the fire extinguishers on the tanks

ples of the gasoline were obtained.

To quote directly from the study: "This method of gaging was somewhat detrimental to the proper functioning of tank E (it had 5 pound pressure) because it necessitated the release of the built-up pressure within the tank and consequent loss of gasoline vapor.

"However, in order to minimize this loss the thief hatch was opened only early in the morning when the pressures in the tank were at minimum.

"Had tank E been so equipped that the volumetric contents and the temperatures of the gasoline could have been determined without opening the gage hatch, the actual evaporation losses during the test period undoubtedly would have been less."

Two principal reasons for using light colored paints are to reduce breathing of the tank by reducing variation of the temperatures of the vapor space, and to reduce the temperature of the vapor above the gasoline in the tank and the surface temperature of the liquid.

Evaporation losses are given in an accompanying table, as taken from a report of this study.

In discussing results the report states:

"The results of this test show that protective housing is more effective in reducing evaporation losses than light-colored painted surfaces alone.

"Although protective housing adds to the initial expense of storage tanks, the savings is such that in many localities the installation would be economical.

"Care must be taken, however, in the installation of protective housings, as only noninflammable material should be used; also, the design of the housing should provide ample protection against wind storms."

Besides a loss in gravity, the gasoline showed a decrease in volatility and an increase in the end point. In the tank painted red the 10 per cent point in distillation increased from 131 to 136 degrees and the end point increased from 415 to 424 degrees.

In regard to pressures the report continues, "In order to obtain the greatest saving possible while operating a bulk station tank under pressure it would be necessary to equip the tank with either an automatic gaging device or with a lquid meter so that the operator could determine the liquid contents of the tank without opening the gage or thief hatch."

An additional factor affecting evaporation given in the report is that of the method of filling the tanks.

"Evaporation losses are high when the gasoline is allowed to splash from the top of the tank so as to form a fine spray, whereas if the tank is filled from the bottom with little turbulence the losses are relatively small.

"The average filling losses in vapor-tight bulk station tanks painted a light color and equipped with low-pressure relief valves when filled from the bottom are probably between 0.25 and 0.5 per cent.

"The emptying of bulk station tanks, especially in the smaller communities often requires from ten days to two weeks. Therefore, the evaporation losses from these tanks during the emptying period are usually high because when the liquid level in the tank declines gradually the vapor spaces above the gasoline increase thus increasing the actual volume of air-vapor mixture expelled from the tank when 'breathing out.'

"In addition, the decrease in liquid content increases the amount of evaporating surface per gallon of gasoline in the tank and increases the ratio of evaporation."

Conclusion of the report states:

"The tests covered in this report show that light-colored paints, tank housing and increased operating pressures

Comparative Data on Tank Protection And Pressure Vents In Study of Evaporation Losses

From U. S. Bureau of Mines Report of Investigation 3138

Tank	Color	Pressure Relief	Evaporation Loss		Loss in Gravity
			Gallons	Per Cent	
A	Painted white Insulated housing	2 ounce	112	1.40	0.45
B	Aluminum foil	2 ounce	170	2.12	0.55
C	Red, 2 coats iron-oxide paint	2 ounce	284	3.54	0.89
D	Aluminum paint two coats	2 ounce	187	2.34	0.62
E	Aluminum paint two coats	5 pounds	118	1.47	0.52

each materially reduce the evaporation losses of gasoline in bulk station storage tanks.

"The results shown by the test on tank E (5-pound pressure) indicate that probably combinations of pressure with light colored paints or tank housing would be the most effective and economical in reducing these losses.

"It is the opinion of the writers that bulk station operators will find it economical to use relief valves that will close quickly and tightly as soon as the pressure within the tank is reduced to the operating pressure of the valves. This will necessitate a somewhat more expensive valve than is now used in many installations.

"The tests show also advantage of designing tanks for new installations to operate under at least 5-pound pressure, and in the older installations of testing the tanks and where possible of equipping them with relief valves which operate under at least 3-pound pressure.

"To reduce evaporation losses from old bulk station tanks which are unsafe at pressure up to 3 pounds per square inch, operators must rely on light colored paints or tank housing to reduce the evaporation losses.

"It will be economical, however, to equip these tanks with quick-acting and tight-seating relief valves operating at low pressures. Such equipment will reduce breathing losses caused by minor atmospheric variations."

New Stations Building

Note: Material used in this column is taken principally from newspapers. NATIONAL PETROLEUM NEWS assumes no responsibility for its accuracy. Headquarters of companies and addresses of individuals are given wherever possible.

The list as published from week to week cannot be looked upon as indicative of the relative extent to which stations are being built in various parts of the country.

Service Stations

Sparta, Wis.—Rasmussen Oil Co.

Bushnell, Ill.—Bushnell Oil & Refining Co.

Russellville, Ind.—W. F. Ramsay.

Scottsburg, Ill.—Fred Lemon.

Turtle Lake, Wis.—Farmers' Equity Cooperative Association.

LeRoy, Ill.—B. F. Howard.

Clintonville, Wis.—Co-operative Oil Co.

New Hope, Ky.—Mr. R. E. Callis.

Marathon, Wis.—Farmers Union.

Covington, Ky.—Standard Oil Co. of Kentucky, Louisville, Ky.

Menomonie, Wis.—John Scott, Hershey, Wis.

Bowling Green, Ky.—Schuster Oil Co.

Milwaukee, Wis.—Dorward Oil Co., 759 N. Milwaukee St.

Pine Bluff, Ark.—Frank Knox, Seventeenth and Ohio Sts.

Marion, Ind. — Alva Williamson, Fourth and Boots Sts.

Alexandria, Ind.—Paul Dunn, W. Washington St.

Milwaukee, Wis.—Lindsay-McMillan Co., 93 S. Water St.

Marion, Ind.—Wana Oil Co.

Clarksville, Tenn.—F. V. Brandt.

Edgerton, Mo.—G. E. Wise, Trimble, Mo.

Lisbon, O.—Winfield Morris.

Detroit, Mich.—Dr. H. Dudley, Kercheval and Bewick Sts.

Magnolia, Tenn.—Producers & Refiners Corp. of Tennessee, 635 N. Front St., Memphis, Tenn.

Reynolds, Ind. — Fred Obenchain, Monticello, Ind.

Rhinelander, Wis.—August G. Urbank.

St. Paul, Minn.—Gold Seal Oil Co., 6th and Olive Sts.

Rhinelander, Wis.—Herbert Livesey.

Alma, Wis.—Alma Oil Co.

Chrisman, Ill.—H. P. Perrin, Routes 1 and 121.

Chrisman, Ill.—O'Hara Filling Station.

Marinette, Mich.—Nels W. Jacobson.

Clintonville, Wis.—Clintonville Cooperative Oil Co.

Burlington, Wis.—Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.

Glasgow, Ky.—Roger Foster, Bowling Green Rd.

Columbus, O.—Richard J. Densmore, 533 South Eureka Ave.

Cedar Rapids, Ia.—Skelly Oil Co., El Dorado, Kan.

Harvey, N. D.—Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.

St. Paul, Minn.—Gold Seal Oil Co. 528 N. 7th St.

Milford Center, O. — Mr. John M. Blake, Milford-Marysville Rd.

Lovington, Ill. — W. H. Atchison, Routes 133 and 32.

Fall River, Mass.—Firestone-Boremco Co.

Kenwood, N. Y.—Colonial Beacon Oil Co., 30 Beacham St., Everett, Mass.

Oyster Bay, N. Y.—Bernard Kempner, South St. Triangle.

Forestville, Conn.—Standard Oil Co. of New York, 26 Broadway, New York, N. Y.

Hartford, Conn.—E. J. Holl, Main and Pearl Sts.

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Ripley, O.—Ripley Oil Co.

Creston, O.—Guy Beaver.

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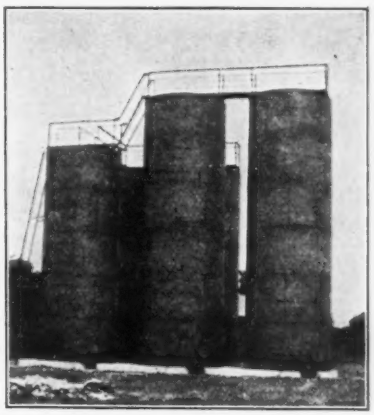

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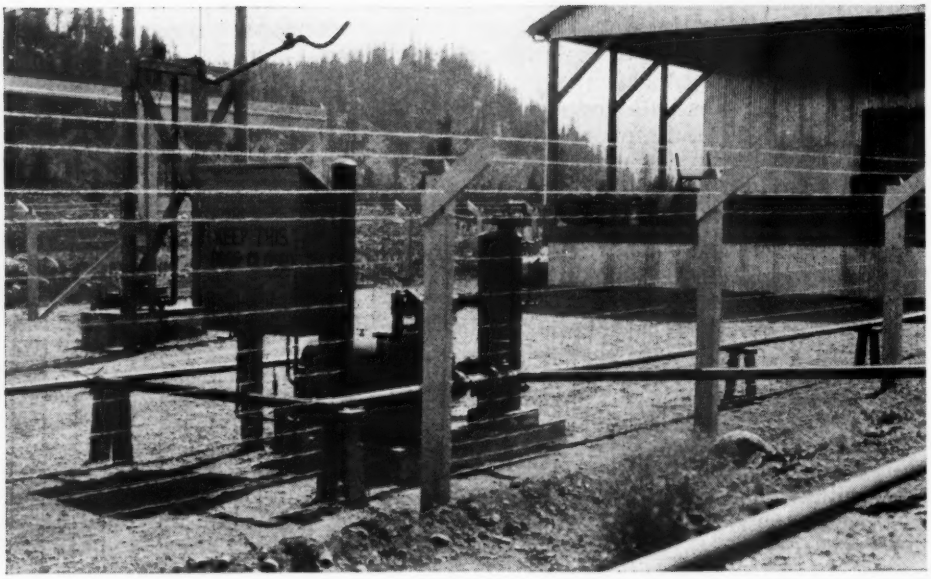


Typical meter installation with pressure controlled pump used by Associated Oil Co. for unloading tank cars from a spur track

Meter is Check on Intra-Plant Losses, In Modernizing Bulk Plants

By James C. Bennett*

ASSOCIATED OIL CO. and other large companies which have used meters extensively have found that they are a profitable investment and a valuable, practical aid in the distribution of refined oils.

Bulk Plants

When applied to either inlets or outlets of bulk plants meters give an accurate accumulative record of the liquid passing through them when operated either on pump or gravity flows. The fact that the record accumulates automatically is of inestimable value to the auditing department.

The impression seems to prevail in some quarters that meters will prevent theft. While this may be largely true, we do not believe that it is fundamentally sound practice to base the application of meters upon the assumption that the employe or agent is dishonest. Rather should it be done through the broader policy of assisting him in properly keeping his records and, in general, increasing the efficiency of operation.

Our experience has shown us that most stock losses are due to some form of carelessness, or lack of knowledge of the elusive quality of the commodity handled, or failure to appreciate what constitutes accurate measure.

Of the three causes mentioned, the first and the last appear to prevail to the greatest extent. Only a small percentage of stock losses are caused by intentional theft. If this were not true we do not see how meters could serve to reduce such losses. But the experience of the companies using them is that they do.

Cases where meters have been tampered with for the purpose of theft are very rare indeed. There are so many other ways in which products may be pilfered with less risk of detection that it is practically never attempted.

It would be almost impossible for any one but an expert to open a meter for the purpose of tampering with it and replace it so that it could not be readily detected. The adjustment is marked and can be registered as well as sealed.

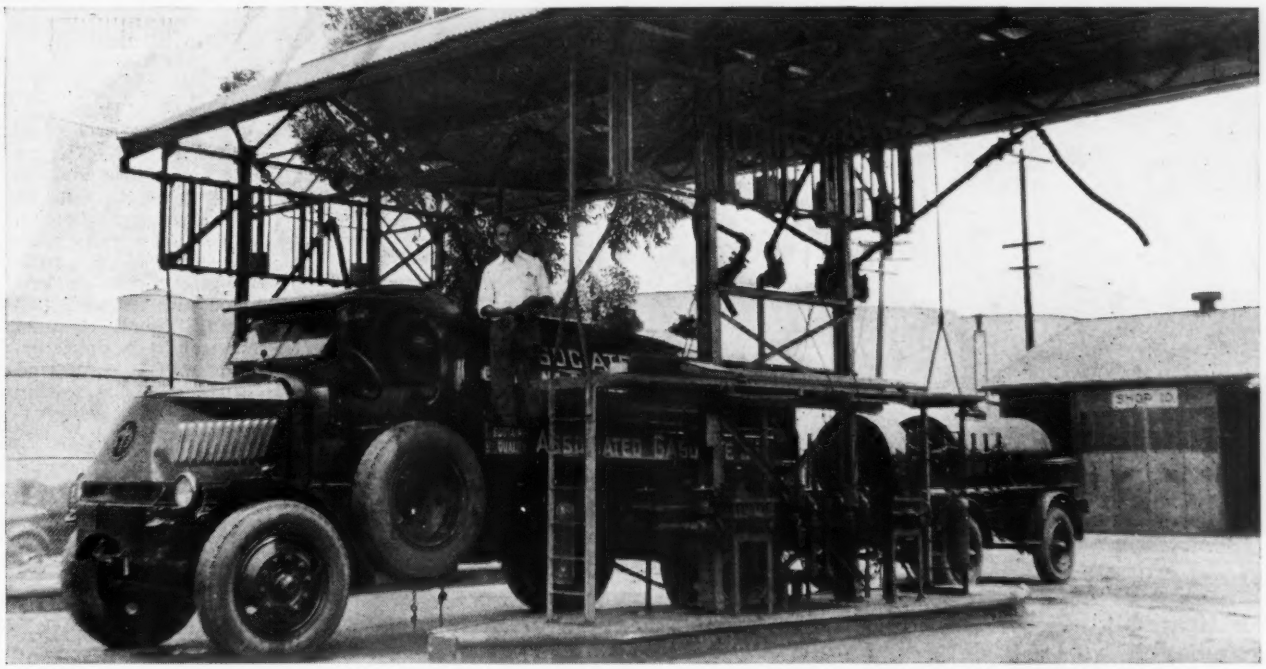
Stock losses cost money. So does the prevention of such losses. There seems to be a definite limit of expenditure that may properly be made to prevent losses, else this may well pass and exceed the value of the losses saved.

Many companies have held to the belief that it was economy to allow a certain percentage of loss without penalty to the agent, rather than to employ the expensive personal supervision required to prevent it.

Wherever meters have been employed in such cases they have fully justified their cost by providing what constitutes a double check both in detail and in total with a consequent reduction of losses at a comparatively small annual expense.

On the other hand there are

*Manager, Automotive Department, Associated Oil Co., San Francisco.



Loading a tank truck and trailer at Associated Oil Co.'s Vernon bulk plant in the Los Angeles Basin. Gasoline, kerosine and lube oils are metered in and out of this depot. View shows a bank of four 2-inch Granberg meters with overhead spouts placed so as to fill trucks on either side of center island

companies that may claim that they do not require meters inasmuch as they do not have or permit stock losses, except those for which they can account by application of temperature corrections and evaporation factors.

Such a condition is usually brought about by seeking salaried agents who will attempt to operate the plants within the prescribed loss.

This practice usually results in frequent changes of agents with special audits and operation of plants by salaries special agents to discover cause of losses, all of which involves considerable direct expense. In some operations accounting must be made gallon for gallon and no allowance whatever is permitted.

Moreover, few commission agents can afford to pay for losses charged back to them, and the practices often resorted to by them to relieve themselves are questionable.

It may well be questioned if such a policy does not cost more than the value of the losses saved thereby. Moreover, the cost is a hidden one and this fact alone places it among the undesirables from an accounting standpoint.

We believe that the use of meters will not only serve to hold stock losses in check, but will reduce auditing and accounting costs as well.

In aproaching any discussion dealing with the relations between any oil company and its commission agents, it should be done with the full realization that there is to date very little common ground of agreement on the subject between the various companies or even between the different departments of the same company which have to deal with it.

The sales department may view an agent largely in terms of sales. The accounting department naturally judges him by the way he handles his stock and controls losses. Hence the ideal agent would be one who was a top salesman as well as a careful accountant, but we all know that this combination is seldom found in one man.

Again, there is the problem of the dishonest agent who may or may not operate his plant with a loss, for it is a matter of record that dishonest agents will often operate their plants with either apparently normal or slightly subnormal losses by passing what would otherwise be a large plant loss on to his customers.

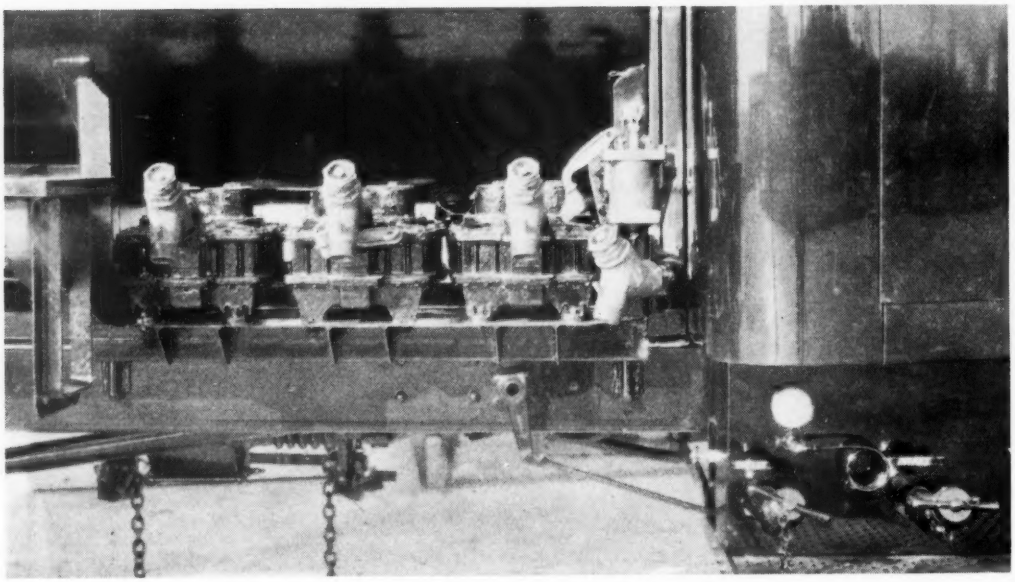
In view of the average customer's carelessness in checking deliveries to him this class of men sometimes get away with this practice, although there is no question that they eventually do their company considerable injury.

On the other hand there is admittedly the honest agent, who is a good business getter but is unable without excessive guidance to operate his plant with a reasonable loss. Too often suspicion is directed at this type of man.

Forced stock loss settlements in such cases nearly always result in a feeling of resentment toward the company which may be silent and therefore all the more harmful.

We also have the dishonest agent who has a heavy loss, and who regards his position in his community of such value to the company in terms of business volume as to enable him to get by with it.

Personal observations have been made where the conditions and attitude of the agents clear-



A bank of three 1½-inch meters typical of installation adopted by Associated Oil Co. on its fleet of tank trucks. The capacity of each meter is approximately 32 gallons per minute with full fluid head. Faucet to right is unmetered and is connected to a 100 gallon kerosine compartment in front part of tank

ly indicated that this situation existed, yet those agents are still on their jobs notwithstanding the evident desire of their companies to be rid of them. Inability to locate a suitable man to take these jobs was the stumbling block.

To briefly summarize them it appears that there are three principal cases that are difficult to deal with:

1. The dishonest agent who hides his operation by passing plant losses to his customers.

2. The honest agent who is a good business getter but has excessive stock losses.

3. The dishonest agent whose standing in his community is such that volume of sales dictates his retention, but good business policy would require his removal.

In cases 1 and 3 the meters would probably serve their purpose better if installed blind, that is, so only the auditor had access to the readings. In this way the auditor would be furnished accurate records of receipts and disbursements that he could be certain were entirely free from any manipulation on the part of the agent.

Thus the true receiving loss or gain and the intra-plant loss, as well as any disbursing loss or gain, would be directly available and the agent's manner of operation could be properly analyzed—for it is quite evident that case number 1 would at once develop an intra-plant loss out of line with previous performance, and case number 3 would either have a dispensing shortage or an intra-plant loss entirely out of reason.

In either case corrections can be made for the reason that the auditor is furnished with sufficient data to reveal what is taking place.

Some of the most grievous and costly errors are made in effecting stock loss settlements in number 2 cases, for if exacting settlements are required a grave injustice may be done to the agent.

It can and does happen that such agents will fall under suspicion and may actually be replaced only to discover that the loss continues as before. Here, meters, open (we recommend the open installation in practically all cases) or blind, would clearly point out where the loss is taking place and indicate the remedy.

A good agent would be freed of suspicion and the company would be saved the expense, both direct and indirect that would be caused by making a change or seeking the solution to the trouble through inadequate data.

In all of these cases, as well as others which are not mentioned here, the proper application of meters would serve to definitely determine true intra-plant losses, and this data when related to turn-overs per year and seasonal weather, should serve to fixe the proper intra-plant loss to be allowed without penalty to the agent.

Whether or not meters will reduce stock losses directly depends entirely upon the point at which the loss may be occurring.

If the loss is occurring at the disbursing outlet, it is safe to predict that a meter at that point will stop it.

If there is an excessive receiving loss a receiving meter will either stop it or determine definitely that it is a receiving loss and fix its amount.

With both recceiving and disbursing meters in any given plant, if the loss continues undiminished, then the meters will serve to segregate any receiving loss or gain that may exist from the loss that is occurring within the plant itself, since the accounting of the receipts and disbursements by meter will reveal the true intra-plant loss no matter what the cause may be.

These are the facts than any auditor should know before tackling the problem of eliminating an excessive loss and the fact that so many small unmetered plants continue to operate with excessive losses even after continued rigid investigation seems proof enough that it has been impossible to obtain loss data that would serve to fo-

calize study on the phase of operation at fault.

The ability to determine, within practical limits of expense true loss that occurs within the plant, between inlet and outlet, lies with meters alone, for the first step in this determination must of necessity be the elimination of all loss at the outlet.

The inability of the auditor to accomplish this with certainty too often results in the more or less futile assumption that illegal withdrawal of products is occurring, which by no means solves the problem but on the contrary often serves to bring on other evils just as bad or even worse.

Of course operation of the plant by special agent may serve to temporarily stop disbursing losses, but the expense of such operation for a sufficient length of time to obtain loss data of real value would be entirely prohibitive.

Intra-plant losses, determined by such short time operation, can be of little value for they certainly could not be used to fix a suitable loss factor that might properly be allowed under average operation for all seasons of the year.

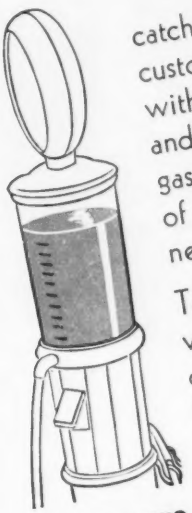
It seems to us that this ability of meters to reveal true intra-plant losses is one of the outstanding features justifying their use.

Their ability to stop outlet losses, if they exist, is of great immediate value unquestionably, but the determination of true intra-plant losses, which data, if properly used, can and will point the way to plant improvement and permanent reduction of such losses, is of great value and one of the true measures of the value of this class of equipment.

In proper operation the truck driver must sell and account for the amount charged to him by the meter. Plant and truck meters can readily be brought and held into close enough agreement to permit this.

It may also be pointed out that where meters are used on tank car rececipts, an accurate account of in transit losses or gains is possible, which would permit the accounting and analysis of true plant and in tran-

SCINTILLATING GASOLINE



catches the eye; therefore, draws customers. It is made by treatment with a DYKEM DYE. Easy to apply, and when used in good anti-knock gasoline, increases the sales appeal of your quality motor fuel. Cost is negligible.

Tell us your color preferences, and we shall forward samples and prices of the correct scintillating producing DYKEM DYE.

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GOOD NEWS for the

THE "Ace" TIRE VULCANIZER

Tire jobs that never paid before, are now a profit to you and to your customer!

HOW many times have you honestly told your customer it wouldn't pay to have the tire vulcanized! You lost a profit to keep a customer's confidence.

NOW—with the revolutionary new ACE Tire Vulcanizer you can take every job and make money on it. You can now honestly tell your customer the *tire is worth fixing.*

Here's a full dozen reasons why:

1. Cure Tread Cuts without removing the rim . . . thru the use of the remarkable new *THERMO-FLEX* Spotter.
2. Four sizes *THERMO-FLEX* Spotters handle all passenger and truck tires.
3. Removable cores for all tire sizes. One small machine . . . one man operation.
4. The right temperature for each tire size . . . each core independently heated, thermostatically controlled.
5. Internal and external heat application . . . uniform, controlled temperature.
6. All heat applied directly, no loss, no bulky equipment.
7. New improved wrap tightening method, equalizes pressure over bead, sidewall and tread. Eliminates wrap tearing.
8. Every part guaranteed!
9. Tread cuts can be repaired at puncture prices!
10. One man can operate the ACE Tire Vulcanizer and wait on trade while the tire is curing!
11. One small stand handles all size cores . . . occupies less than 4 feet of floor space.
12. One small investment with lowered overhead . . . means business getting prices.

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***THERMO-FLEX* SPOTTER**

Cures Tread Cuts on the Rim..at puncture prices.

Four sizes handle all tires. May be used with your present equipment.

Thermo-Flex Spotters (set of 4, with 2 Thermostats) Price $26.00 F. O. B. Reading, O.

New ACE Tire Vulcanizer

Cores handle largest to smallest tires. Occupies less than 4 feet of floor space.

Special Introductory Offer!

(until Dec. 1, 1931)

ACE TIRE VULCANIZER Complete with standard equipment $230 F.O.B. Reading, Ohio

Standard equipment includes: Stand, Wrap Tightener; Rim Bracket; Core Bracket; 4 *Thermo-Flex* Spotters; (two interchangeable thermostats) 7 inside Cores as follows: 4.50; 4.75; 5.00; 5.50; 6.00; 30 x 5; 32 x 6; Roll of wrapping tape (144 yards).

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SPOTTER

ANOTHER Gewert achievement! The Ace ***Thermo-Flex*** Spotter. *For surface cuts it is not even necessary to remove the rim!* Just place the inflated tire on the rim bracket, treat the cut, place the Thermo-Flex Spotter over it, wrap and plug in! The Ace ***Thermo-Flex*** Spotter applies the right amount of heat to the outside of the vulcanizing job. Interchangeable thermostat controls the heat...no chance for a poor job. Requires no attention.

Note the Thermo-Flex Spotter in place and the webbing partially wrapped.

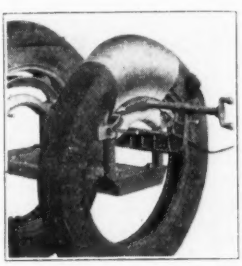
From Ford Tires to Bus Tires

One man handles them all on the Ace Tire Vulcanizer. All Ace Cores are removable. The core slips into the tire on the floor or on the spreader, wherever it is handiest...and the core is then placed on the stand, the work of a few seconds...all by one man.

See how easily the Ace Core is slipped into any size tire... by one man!

No wrestling match with hot molds

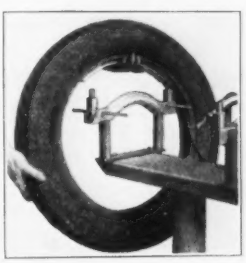
Notice how simply and easily the Ace Vulcanizer Core is placed on the stand. No great expense and inconvenience for stationary steam equipment. Just one small stand with cores to meet all your trade requirements. Each core is individually heated by most practical, economic method known today. The right temperature, held exactly by thermostatic control, where you need it. At a 6c K. W. rate the largest truck tire is cured for a 5c current charge!



Even, uniform pressure, applied at body level to the bead, sidewalls and tread, now possible with the new Ace Tightening Assembly.

ACE Wrap Tightener

The new Ace Tightening Assembly puts uniform pressure completely around the vulcanized surface! Notice, the Ace Tightening assembly operates at body level, not up and down. Tension is brought to bear equally on the bead, sidewalls and tread, not to the tread alone! Tightening bracket conforms to the shape of the tire; this insures even pressure, eliminates wrap tearing. Greater pressure possible.



Placing the core and tire on the stand is as easy as putting your hat on your head!

Mail the coupon today.

Other size cores available are: 6.50; 7.00; 36 x 6; 34 x 7; 38 x 7; 40 x 8; 36 x 8 and 8.25 Bus Balloon; 38 x 9; 42 x 9; 40 x 10; 44 x 10; 9.00 Bus Balloon; 9.75 Bus Balloon. Write for prices.

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- ☐ Please send one ACE Tire Vulcanizer with standard equipment at special price $230.00 F.O.B. Reading
- ☐ Please send one set of *Thermo-Flex* Spotters $26.00 F. O. B. Reading
- ☐ Please send new Vulcanizing Instruction Book FREE.

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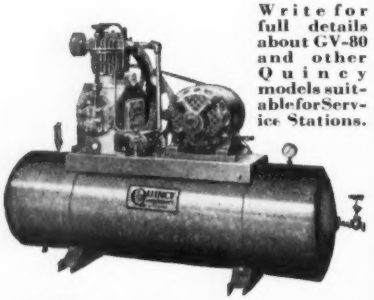
Here's the new Quincy GV-80, Two-Stage, Air-Cooled Compressor Unit, with startling new features that decrease operating costs, reduce vibration, increase life—Lynite connecting rods, oversize Timken main bearings, gear oil pump, fan type pulley, and many others.

Displacements from 13.3 to 21.6 C. F. M. Maximum continuous pressure, 200 lbs.



Write for full details about GV-80 and other Quincy models suitable for Service Stations.

QUINCY Compressors

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sit losses in their proper relation.

Tank Trucks

Installed on tank trucks meters provide a simple method of truck accounting by maintaining a continuous mechanical record of deliveries which is positive and accurate beyond dispute. Their use in this work also averts all possibility of argument between the customer and the salesman.

With meters, truck tanks may be built with fewer compartments, and in the case of trucks handling one commodity only, single compartment tanks are permissible.

The truck is relieved from the necessity of making full compartment deliveries. Split compartments do not have to be bucketed.

Sales are made directly by the meters and these may be placed under the seal of the local sealer of weights and measures if desired.

The trucks may be routed instead of dispatched, with considerable saving in mileage. There is also some saving to be made through the fact that storage may be filled to capacity regardless of the quantity it may require.

The meters serve as a constant check against the accuracy of the loading rack meters and vice versa. They are also used to calibrate new as well as existing service station storage.

Disputes with customers are avoided. Claims for short measure are held to a minimum and in many cases eliminated entirely.

The trade readily accepts meter deliveries. While a few may object at first, it is not difficult to show them that the meters are correct and that they are receiving the full amount they are billed for.

It is usually desirable to equip gravity trucks with two 2-inch meters. The rate of flow through each meter with two-inch hose will average 38 gallons per minute, where the hose is not coupled to the service station inlet.

Where it is so coupled the rate through each meter will increase to an average of about 50 gallons per minute, or about the same as that now secured without meters.

In the case of distillate trucks, the meter—one to the truck, is usually operated by a pump driven by the truck engine, and there is no appreciable reduction in the rate of delivery.

Delivery is made by wet hose, controlled by the nozzle at the discharge end. Sale is made by the meter and there is no necessity of adhering to full or even compartments. The customers' storage can be filled to capacity and the entire delivery operation is expedited.

Single compartment truck tanks may be used or multi-compartment tanks may be manifolded to the single meter.

If it is desired to use the truck for gasoline service in the summer season, two meters may be installed and the truck used as an ordinary gravity metered truck during that season.

Here again, there is the constant check against customers' gauges and the opportunity of readily keeping them correct. Truck mileage per 1000 gallons delivered is reduced.

In this connection it may be well to refer to a paper read before the Eastern Transportation Committee of the A. P. I. by F. R. White, automotive transportation manager, New York city division, Standard Oil Co. of New York, in which he states that there is a saving of 33 1/3 per cent by the use of meters on this class of trucks.

In other words, two trucks with meters do the work of three without them.

The accessories may include the automatic stop feature which stops the pumping when the compartment is shell dry. This permits the operator to remain at the point of delivery and eliminates racing of the engine when the compartment is emptied. It also eliminates the possibility of pumping air into the meter, which would affect its accuracy.

Trucking Today Brings New Facilities, New Problems, to Oil Companies

THE general subject of truck transportation of petroleum products is one which offers possibilities to the oil marketing company for making considerable savings in handling present equipment; also, in any planning ahead, or modernization program, undertaken by the oil company to insure its future operations are to be on the most efficient basis, study of this subject is important.

Not only is the transportation equipment now offered by the truck manufacturers being continually improved, but conditions under which the oil marketing companies operate trucks, trailers and semi-trailers is continually changing.

The constant improvement of roads adds to the possible territory the bulk plant may serve. The trend to larger storage at gasoline stations makes imperative changes in the unloading facilities of the unit to save the time the truck is standing idle. The raising of speed limits on highways brings other problems, unless the oil company unit is to be derisively honked at by the impatient motorists on the road.

Appearance value of the truck unit on the streets is rated higher than ever before, and is having its effect on design, as witness the gradual disappearance of the unsightly lubricating oil cans and racks from the sides of the truck.

The handling of an additional "third" grade of gasoline, the present trend in many territories, brings another problem to the transportation department, making necessary additional compartments in tanks on trucks, or the putting into service of extra equipment to handle the new grade.

Again, regulations of state highway departments as to the weight that can be hauled on the roads varies and, in these days of train hauling, these regulations must be kept in mind in assembling the equipment, as well as operating it.

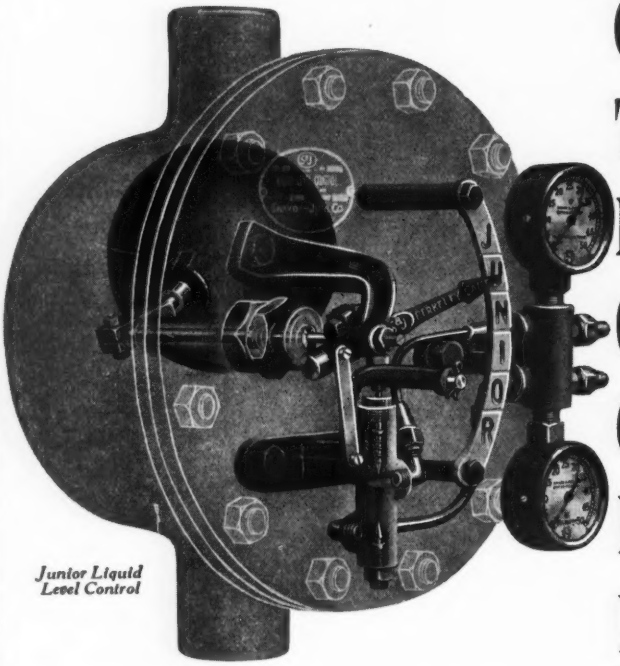
In many oil companies, supervision of truck operation and maintenance is left in the hands of someone who has too heavy other duties to give the subject of saving costs here the proper attention. Yet savings in the transportation department are as important as in any phase of oil company operations, and shows up on the books at once. A saving of a tenth of a cent a gallon only in delivering 10,000,000 gallons of gasoline over a year amounts to $10,000 for the year, a sizable amount for the company operating on this scale of operations.

To secure a background of information as to how smaller oil marketing companies handle truck operations throughout, as preparatory to further study of

Next Article on Trucks

IN THE Nov. 4th issue of NATIONAL PETROLEUM NEWS, A. W. Schmoldt, general superintendent of Cities Service Oil Co., Cleveland, tells how his company keeps costs down by a careful study of all phases of truck operation, to avoid duplication of delivery effort and to keep idle time of trucks as low as possible.

WHEN YOUR PROBLEM IS TO CONTROL THE LEVELS OF HIGH GRAVITY LIQUIDS, DO IT



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The following bulletins describe in detail the highest quality an d type equipment for the oil trade.

Bulletin No. 50A. Liquid level controls, diaphragm valves, air separators, air filters, air reducing valves, etc.

Bulletin No. 51. Hydraulic internal valve system for gasoline truck tanks and tank cars, safety domes, gate valves, faucets, vents and special equipment for aluminum tanks.

Bulletin No. 52. Vacuum and pressure vent valves, automatic tank gauge, internal safety valve, cable winch, sheave bracket, swing joints, tank nozzles, explosion vent relief, gauge hole covers, gate valves, swing joints for loading racks, etc.

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modernization of this particular line of equipment, a NATIONAL PETROLEUM NEWS staff man visited a number of marketing companies and studied various phases of truck operation as now carried on.

The companies visited handled volumes of gasoline ranging from 900,000 gallons to 15,000,000 gallons a year and from 150,000 gallons to 1,350,000 gallons of kerosene and also varying amounts of furnace distillate. Motor vehicle equipment of these companies ranged from four small trucks to a fleet of 37 company owned truck sand 30 trucks commissioned. A very small number of the oil companies visited operated the modern semi-trailer units.

A surprising fact brought out in the survey was that the trucks of these companies had small size outlets, two inches in some cases and inch and a half in many cases. One company was using three-inch outlets on its larger trucks. This meant that the gasoline dispensing equipment of these companies is taking unnecessary time to dump gasoline into tanks which will take the contents of one or more truck compartments.

All but four of the companies visited equipped their trucks with fire extinguishers and these were installed at places easy to reach and were in good working order, as far as observation could tell. One company which carried no extinguishers on its trucks had a fire a few years ago in its garage which burned three trucks. A little less than half the companies had equipped their trucks with devices to shut off the flow of gasoline from compartments in case of accident breaking the regular outlet valves. Some companies have these devices on the large trucks but not on small ones.

The NATIONAL PETROLEUM NEWS survey showed the extent to which oil delivery trucks are now equipped with pneumatic tires. Fourteen companies have pneumatic tires on all their trucks. The other companies were still in the stage of shifting from hard tires to pneu-

matics on some pieces of equipment.

The oldest truck found in service among these companies was bought in 1919, there were a few eight or nine years old and still kept in service, at least in emergency service. The average age of the truck equipment now in service was around three years. About half the companies had equipped their trucks with quick coupling unloading hose, the remainder were still using the old type unloading hose. None of the trucks canvassed were equipped with meters for registering deliveries of either gasoline or fuel oil. Trucks for practically all companies had dials and markers by which the driver keeps track of the volume delivered in buckets.

The majority of the tank trucks were equipped with side racks for carrying lubricating oil in cans, the cans being in various stages of condition. A few companies have dropped the side racks and cans as unsightly and are making lubricating oil deliveries on platform trucks or in other trucks with special compartments.

Trailers were in little use by these oil marketing companies, but the drop frame semi-trailers were found to be coming into service.

In most cases the driver seemed to be the authority on truck routing. In rural territory this duty is left almost entirely to the driver and in towns and cities the driver is given the list of dumps but his routing to those destinations is left to his choice. In only a few cases, with smaller companies, does it seem to be the practice, this NATIONAL PETROLEUM NEWS man observed, for the company to designate one official to correlate the routing of the various transportation units to make sure that the companys deliveries all told were handled at the minimum cost.

One company visited, however, establishes the routes for its trucks through a superintendent and a supervisor rides over the route with the regular driver at stated intervals. Country deliveries, it was found, are left almost entirely to the judg-

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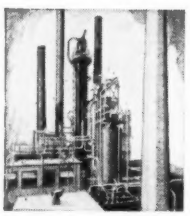

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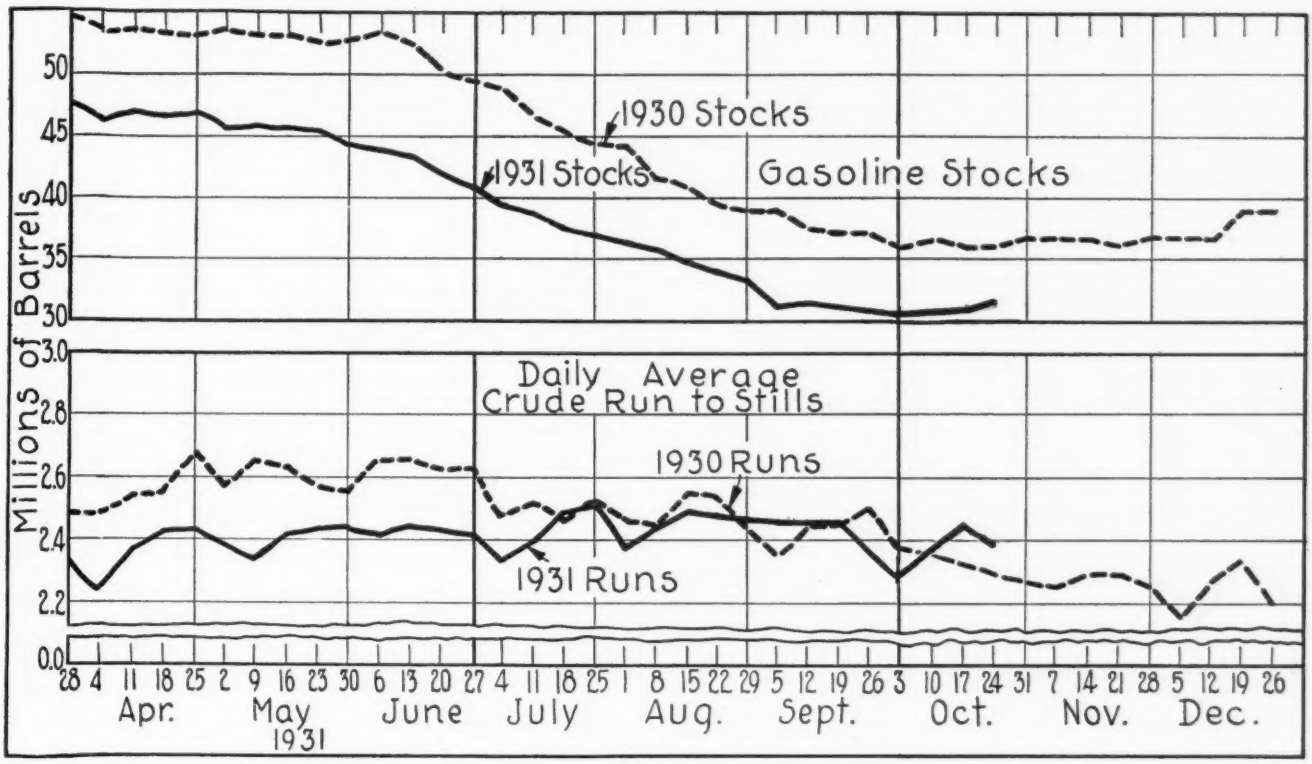
ment of the driver, on the basis that the driver knows the territory and the trade and can best use his judgment as to how it is to be served. In many cases the driver on country routes is also supposed to sell accounts; but a few companies now seem to be putting regular salesmen on country routes and letting the truck driver stick more closely to the task of keeping the truck moving in straight delivery service.

The driver is held responsible by most of the companies visited on this survey, for inspection of his equipment to see that it is maintained in good operating condition, but several of even the smaller companies with a small number of trucks, keep a mechanic who goes over the transportation equipment at regular intervals and makes minor repairs and determines when other servicing is neccessary. The periods for such inspection vary from a week to a month. Many companies have no regular schedule for painting trucks, undertaking the task when someone in authority finds it is needed. Other companies have a regular schedule of painting once a year, or once in 18 months, doing the work in the winter slack season. Fairly definite schedules are maintained for greasing and washing trucks.

Present practice varies considerably as to whether repair work is done by the company mechanic, or the truck is sent to a regular service garage. Some of the smaller companies do all their own repair work, a good many do minor work and send major jobs to the service garage. Some send all repair jobs to the outside garage. Oil companies doing their own work maintain garages with complete equipment, others keep on hand only small tools.

When it comes to record systems for keeping complete track of truck operating costs, practice varies greatly both as to system and as to the individual with the company whose task it is to keep up the records. Consequently, figures as to delivery cost on a gallonage basis are not comparable in many cases.

U. S. Crude Runs and Gasoline Stocks as Reported Weekly by A. P. I.



Refinery Gasoline Stocks Increase 382,000 Barrels

By Telegraph

NEW YORK, Oct. 27

GASOLINE stocks at refineries increased 382,000 barrels in the week ended Oct. 24 as refiners failed to reduce their crude runs to stills in line with declining seasonal demand. Total refinery stocks Oct. 24 were 31,218,000 barrels at plants reporting to the American Petroleum Institute.

Stocks of gasoline at terminals east of California and in water borne transit to these terminals increased 203,000 barrels during the same week. The total increase in gasoline stocks outside of the bulk plant and retail distributing system thus was 585,000 barrels.

Refiners reduced their crude runs to stills 42,700 barrels during the week, largely at inland refining groups. Runs averaged 2,399,400 barrels daily which utilized 65.5 per cent of capacity. In the week ended Oct. 17 refiners used 66.7 per cent of their still capacity.

Indiana-Illinois refiners drew 164,000 barrels of gasoline from storage when they cut their crude runs 13,000 barrels daily average. Oklahoma-Kansas refiners cut their runs a similar amount but increased their gasoline inventories 113,000 barrels. Texas plants added 183,000 barrels of gasoline to storage and California refiners 171,000 barrels.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels)				Cracked % of Total Capacity Reporting	Gasoline Production Daily Av. Production (Barrels) Week Ended	
		Oct. 24	Oct. 17	Oct. 24	Oct. 17	Gasoline Oct. 24	Gasoline Oct. 17	Gas & Fuel Oil Oct. 24	Gas & Fuel Oil Oct. 17	Oct. 24	Oct. 24	Oct. 17
East Coast	100.0	464,300	460,900	73.3	72.7	4,079	4,045	10,405	10,802	94.0	93,600	96,300
Appalachian	91.8	109,400	110,300	79.6	80.3	1,330	1,296	1,641	1,657	96.1	26,400	27,300
Ind., Ill., Ky.	98.9	339,100	352,100	78.6	81.6	3,337	3,501	5,449	5,285	95.5	88,000	87,400
Okla., Kans., Mo.	89.6	242,900	256,700	55.8	59.0	2,868	2,755	5,057	5,041	92.3	54,400	64,100
Texas	91.3	558,700	551,300	73.0	72.0	5,634	5,451	11,348	11,570	96.8	141,400	140,300
La., Ark.	98.9	154,100	172,400	66.9	74.8	711	696	3,742	3,602	100.0	34,200	37,600
Rocky Mountain	89.4	39,000	48,000	27.1	33.7	1,284	1,288	831	831	98.5	12,400	13,600
California	97.1	491,900	490,400	55.4	55.3	11,975	11,804	96,958	97,125	100.0	38,400	24,500
Total	95.2	2,399,400	2,442,100	65.5	66.7	31,218	30,836	135,431	135,913	95.6	488,800	491,100
Texas (Gulf Coast)	99.8	427,400	414,000	80.4	77.9	4,229	4,106	8,058	8,226	98.6	113,400	114,600
La. (Gulf Coast)	100.0	107,000	121,000	72.5	82.0	554	544	2,871	2,693	100.0	26,400	29,900

Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations, Week Ended October 23 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended Oct. 23
Plants Reporting	10	23	23	10	10	76
Da. Av. Cap. (bbls.)	94,000	162,500	107,400	71,500	60,700	496,100
Da. Cracking Capacity	53,200	64,600	23,100	26,250	31,700	198,850
Da. Av. Crude Runs	59,164 — 12.3	92,050 — 2.4	63,247 + 6.6	18,207 — 48.1	41,009 — 0.7	273,677 — 6.7
Da. Av. Other Oil	6,339 — 3.4	2,498 — 40.3	4,218 + 55.5	338 — 13.6	16,856 — 9.8	30,249 — 7.0
GASOLINE—Gallons						
Stocks, Oct. 16	20,286,000	35,152,000	27,338,000	15,490,000	5,103,000	103,369,000
Prod. 10-16 to 10-23	11,803,000 + 8.0	16,530,000 — 6.4	10,000,000 + 7.3	2,256,000 — 41.2	6,063,000 + 0.9	46,652,000 — 0.9
Ship. 10-16 to 10-23	9,280,000 — 25.9	15,676,000 — 11.2	9,939,000 + 17.1	2,154,000 — 31.5	6,230,000 — 19.3	43,279,000 —12.6
Stocks, Oct. 23	22,809,000 + 12.4	36,006,000 + 2.4	27,399,000 + 0.2	15,592,000 + 0.7	4,936,000 — 3.3	106,742,000 + 3.2
Ratio Sales to Prod.	78.6%	94.8%	99.4%	95.5%	102.8%	92.8%
KEROSINE—Gallons						
Stocks, Oct. 16	11,467,000	13,252,000	3,276,000	14,000	395,000	28,404,000
Prod. 10-16 to 10-23	1,709,000 — 10.2	1,738,000 — 11.8	834,000 — 5.7	....	375,000 + 8.1	4,656,000 — 8.8
Ship. 10-16 to 10-23	1,548,000 + 2.8	1,043,000 — 54.2	1,210,000 + 35.8	....	440,000 + 5.5	4,241,000 — 16.7
Stocks, Oct. 23	11,628,000 + 1.4	13,947,000 + 5.2	2,900,000 — 11.5	14,000	330,000 — 16.5	28,819,000 + 1.5
Ratio Sales to Prod.	90.6%	60.0%	145.1%	.....	117.3%	91.1%
STOVE DISTILLATE—Gallons						
Stocks, Oct. 16	2,121,000	14,549,000	196,000	121,000	51,000	17,038,000
Prod. 10-16 to 10-23	880,000 + 47.9	786,000 + 17.0	207,000 + 93.5	25,000 + 19.0	40,000 + 8.1	1,938,000 + 35.3
Ship. 10-16 to 10-23	529,000 — 12.9	2,523,000 + 64.0	71,000 — 28.3	60,000 +106.8	60,000 +150.0	3,243,000 +122.1
Stocks, Oct. 23	2,472,000 + 16.5	12,812,000 — 11.9	332,000 + 69.4	86,000 — 28.9	31,000 — 39.2	15,733,000 — 7.7
Ratio Sales to Prod.	60.1%	321.0%	34.3%	240.0%	150.0%	167.3%
GAS OIL—Gallons						
Stocks, Oct. 16	12,223,000	44,137,000	7,660,000	1,775,000	8,639,000	74,434,000
Prod. 10-16 to 10-23	533,000 — 65.9	192,000 — 80.2	206,000	500,000 + 10.6	2,237,000 — 18.2	3,668,000 — 34.9
Ship. 10-16 to 10-23	595,000 — 14.2	1,649,000 +2109.2	500,000 + 92.3	683,000 + 73.3	2,835,000 + 1.6	6,262,000 + 48.5
Stocks, Oct. 23	12,161,000 — 0.5	42,680,000 — 3.3	7,366,000 — 3.8	1,592,000 — 10.3	8,041,000 — 6.9	71,840,000 — 3.5
Ratio Sales to Prod.	111.6%	858.8%	242.7%	136.6%	126.7%	170.7%
FUEL OIL—Gallons						
Stocks, Oct. 16	14,433,000	69,867,000	88,002,000	25,214,000	21,966,000	219,489,000
Prod. 10-16 to 10-23	5,338,000 + 31.9	6,074,000 + 26.8	6,992,000 + 13.5	1,178,000 — 74.6	4,444,000 — 13.8	24,026,000 — 3.1
Ship. 10-16 to 10-23	5,230,000 — 6.4	4,447,000 — 42.4	6,102,000 + 24.2	2,764,000 — 19.3	4,863,000 — 15.1	23,406,000 —14.5
Stocks, Oct. 23	14,541,000 + 0.7	71,494,000 + 2.3	88,899,000 + 1.0	23,628,000 — 6.3	21,547,000 — 1.9	220,109,000 + 0.3
Ratio Sales to Prod.	98.0%	73.2%	87.3%	234.6%	109.4%	97.4%

Gasoline Produced by Various Methods, Week Ended October 23

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	% of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	6,264,000	53.1	8,908,000	53.9	5,999,000	60.0	1,671,000	74.1	3,034,000	50.0	25,873,000	55.5
Cracked	4,678,000	39.6	6,031,000	36.5	3,094,000	31.0	457,000	20.3	2,420,000	39.9	16,685,000	35.8
Natural	861,000	7.3	1,591,000	9.6	905,000	9.0	128,000	5.6	609,000	10.1	4,094,000	8.7
Total	11,803,000		16,530,000		10,000,000		2,256,000		6,063,000		46,652,000	

+ or — columns are % change over previous week.

Mid-Continent Runs Cut 19,600 Barrels Average

Staff Special—By Telegraph
TULSA, Oct. 27

MID-CONTINENT refiners made a sharp curtailment in runs the week ended Oct. 23, reducing charges to stills 19,600 barrels daily average. All districts except North Texas curtailed operations.

Output of gasoline was 400,000 gallons less than in the preceding week. Shipments fell 6,200,000 gallons and stocks rose 3,300,000 gallons. Shipments were larger than in the week before in only the North Texas district.

Kerosine shipments and output fell. Stocks increased slightly.

Distillate shipments increased 1,700,000 gallons. Output was increased only 500,000 gallons, causing a 1,300,000-gallon draft on stocks.

Gas oil stocks were lowered when production was curtailed and demand rose. Fuel oil stocks increased slightly.

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Oct. 23. Change in stocks figured from Sept. 25.

GASOLINE

	Gallons
Production	183,168,000
Shipments	182,680,000
Net change in stocks	+488,000
Ratio sales to production	99.7%

KEROSINE

Production	20,019,000
Shipments	18,132,000
Net change in stocks	+1,887,000
Ratio sales to production	90.6%

STOVE DISTILLATE

Production	6,201,000
Shipments	7,419,000
Net change in stocks	—1,218,000
Ratio sales to production	119.6%

GAS OIL

Production	18,750,000
Shipments	22,680,000
Net change in stocks	—3,930,000
Ratio sales to production	121.0%

FUEL OIL

Production	90,555,000
Shipments	98,695,000
Net change in stocks	—8,140,000
Ratio sales to production	109.0%

Production of Benzol

(Continued from Page 86)

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Petroleum Accountants Name Directors

TULSA, Oct. 24.—Directors of the Petroleum Accountants' Society of Oklahoma were elected at the annual meeting and banquet here Oct. 22. Those elected were:

L. P. Harrington, Pure Oil Co.; L. D. Messner, Barnsdall Oil Corp., and D. B. Catterlin, Gypsy Oil Co., all of Tulsa. Messrs. Messner and Catterlin were re-elected. The directors will meet in the near future and nominate officers.

The election followed the banquet which was featured by talks by R. C. Beckstrom of the University of Tulsa, who returned several weeks ago from a several months stay in Russia, and R. E. Langenheim, a member of the university faculty.

Paramount Moves Offices

TULSA, Oct. 24.—Announcements have been received here of the removal of the general offices of the Paramount Petroleum Co. of Kansas City, to suite 901 to 903, 21 West Tenth St. L. C. Hickox is president of the company.

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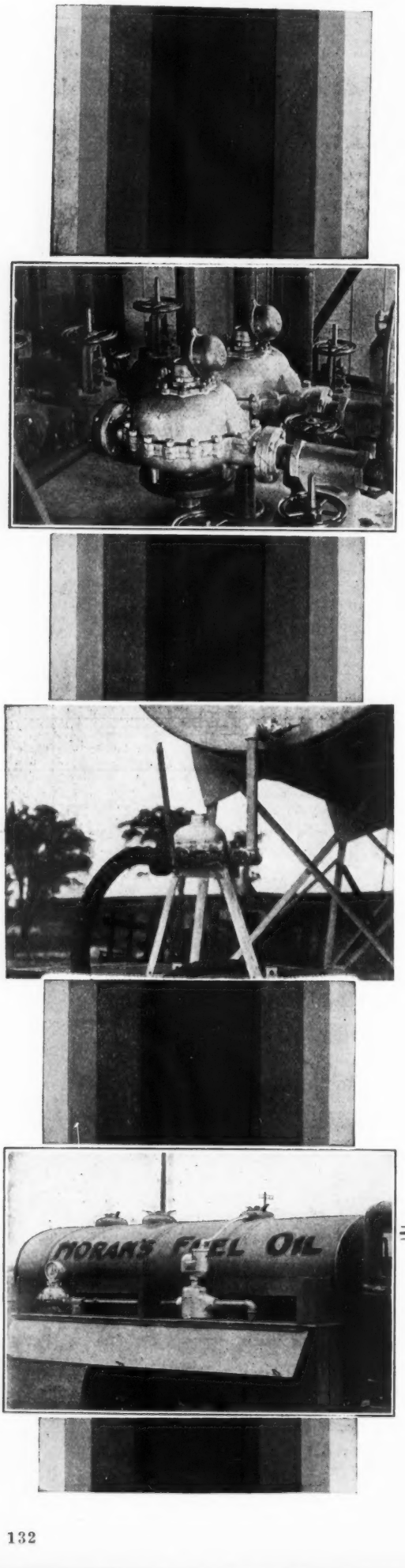

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Refinery - Tank Wagon Markets

Gasoline Scarce in Mid-Continent; Quiet in Other Districts

CLEVELAND, Oct 26

REFINERY markets of the country were generally slow during the past week except in the Mid-Continent where gasoline prices continued to rise under the impetus of a lower rate of crude runs to refinery stills.

In Oklahoma and Kansas tank car prices on gasoline generally rose 0.5 cent per gallon. Other Mid-Continent districts reported advances from 0.25 to 0.5 cent per gallon.

Refiners who have cut back their operations in the Mid-Continent have been buying gasoline which showed up in the hands of brokers with the result that the floating supply was small at the end of the week.

In the Chicago resale market gasoline prices had advanced 0.25 to 0.375 cent per gallon by the end of the week. Spot buying by jobbers was reported more brisk Friday and Saturday.

Eastern gasoline markets were unsettled as Atlantic Refining Co. posted a cut in retail prices in eastern Pennsylvania and distribution of third grade gasoline increased in New England.

In New England tank car prices were lower but in other key markets were steady, although jobbers were reducing their scale of purchases to minimum requirements.

French buyer placed an order on the Gulf for a mixed cargo for November lifting and Japanese interests were inquiring on the West Coast. While East Coast buyers continued to show some interest in California goods, prices were reported still too high in view of the scale of prices at the Gulf.

Natural gasolines were becoming scarce and prices in the Mid-Continent advanced 0.25 to 0.5 cent per gallon, as refiners bought more actively in preparation for a more volatile winter gasoline.

Heavy grades of burning oils were in fairly good demand in all refining districts during the week although there was little change in price ranges. Cooler weather will be needed to give these markets impetus.

Lubricating oils generally were quiet during the week. In Pennsylvania, steam refined oils were offered more freely and bright stocks were easier to obtain at prices which were largely unchanged.

Jobber Buying Improves at Chicago

Staff Special

CHICAGO, Oct. 24

FURTHER improvement was manifested in the Chicago gasoline market in the week ended Oct. 24. Some improvement was noted in spot buying late in the week, while demand from contract buyers was steady. Several refiners also were reported in the market for gasoline.

The general position of the market remained practically unchanged from that of the previous week. Resellers here, who have lost some of their sources of supply due to shut-downs and curtailments in crude runs, were expecting some of these plants to reopen, but most of them still were out of the market at the end of the week.

Spot gasoline buying was decidedly light most of the week, but enough buying was being done by refiners to take up this slack and spot prices continued to move higher. Buyers generally reported that there was very little "distress" gasoline disturbing the market.

Several traders reported a pick-up in jobber buying Friday and Saturday and said they believed it would improve further. A consumer was reported seeking bids on an order for approximately 1,000,000 gallons of gasoline for delivery over the next six months, but nothing was available yet as to the price at which it would go.

Summary of Group 3 Quotations for U. S. Motor Gasoline

In Effect Oct. 26; 1931

	Below 57 Octane No.	57-65 Octane No.	Above 65 Octane No.
Okla.	4.00-4.25	4.25-4.50	4.75
Kans.	4.00-4.25	4.25-4.50	4.50-4.75
N. Tex.	4.00-4.125	4.25-4.375	4.50-4.625
W. Tex.	4.00-4.125	4.25-4.375	4.50-4.625
La.-Ark.	4.00	4.25	4.50
Ind.-Ill.	†3.75-4.00	.....	.....

Prices are those quoted on the basis of f.o.b. Group 3 by refiners in the districts designated.

†Nominal

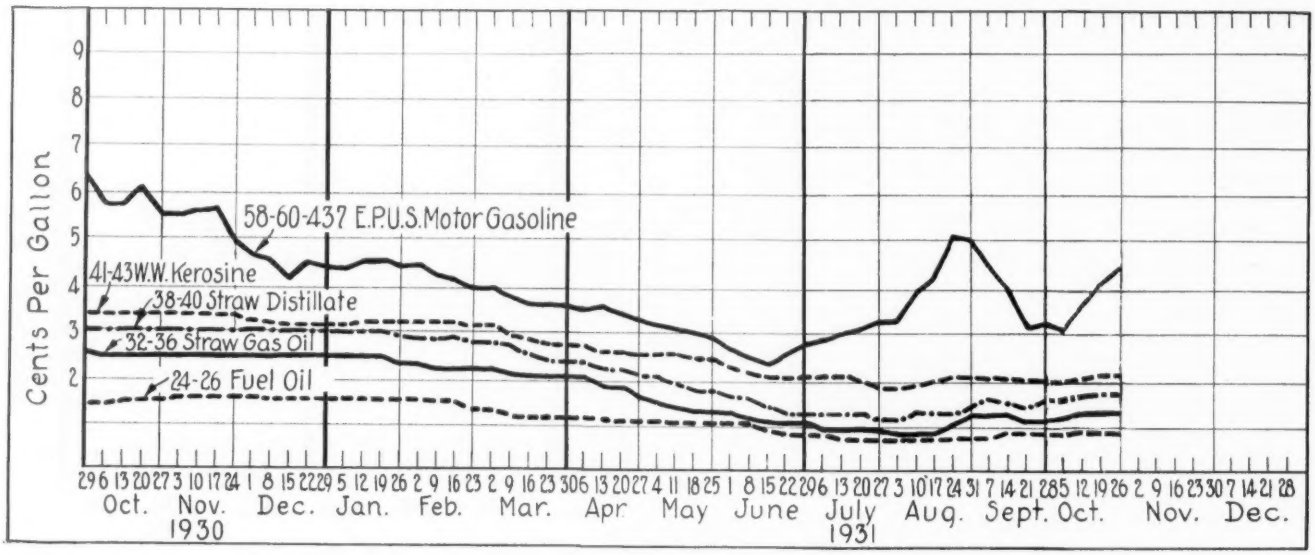
Spot prices on most grades of gasoline were up 0.25 to 0.375 cent during the week. The low of the price range for U. S. Motor gasoline, under 57 octane number, moved up from 3.50 to 3.75 cents by Oct. 24. The range for this product from Oct. 22 on was 3.75 to 4 cents, with less being offered at the low price on Oct. 24 than previously.

Higher gravity gasoline continued to maintain their excellent position and apparently there was not enough of these grades being offered on the open market to much more than take care of demand. The result was a steady call for goods at prices which gradually moved upward.

Kerosines were steady in price with demand fair. One refiner, who had offer 41-43 w.w. to resellers at 1.875 cents, moved his price to 2 cents and reported a fair business at that figure. Sales to jobbers were reported at 2 to 2.125 cents.

Distillates, gas oils and the higher gravity fuel oils were not particlarly

Current Prices of Principal Mid-Continent Refined Products



Prices shown are in Group 3 basis and extended to date shown in Refinery Market Table Section of this issue

active. Tank car business was fair, but sellers said it would take a spell of cold weather to bring much action. A number of distributors advanced their retail tank wagon prices 0.25 to 0.50 cents on most grades of home burner oils.

Correction

Price of 32-36 ordinary dark gas oil in the Chicago tank car market was erroneously published at 1.125 to 1.25 cents, as of Oct. 19, in the Oct. 21 issue of NATIONAL PETROLEUM NEWS, page 56.

Correct price on Oct. 19 was 1.25 cents flat.

George Brockway, Former Warren Refiner, Dies

CLEVELAND, Oct. 28.—George P. Brockway, for many years head of the Seneca Oil Works of Warren, Pa., died Oct. 21 at Albuquerque, N. M. The funeral was held Oct. 25 at Warren.

Mr. Brockway was born May 3, 1858, in Hartford, Conn. In early manhood he went to Oil City where he became associated with S. Y. Ramage in a refinery at Reno. He became manager and treasurer of the Seneca plant at Warren in 1895 and its head when O. F. Huffman died.

The Seneca plant was sold to the Swan-Finch Oil Corp. in 1928 and Mr. Brockway retired from active business. He then made his home in San Diego, Calif.

When en route to Warren in early September, Mr. Brockway became ill in Cleveland and spent some time in a hospital here. He decided to return to his home. He became worse during the trip and was removed to a hospital in Albuquerque.

For many years Mr. Brockway was active in the affairs of the National Petroleum Association and worked constantly in the interests of the western Pennsylvaia refiners. He also was active in civic, social, and church affairs in Warren. At one time he was a colonel of the Sons of Veterans, his father having been a drum major in the Civil War.

He is survived by his widow, formerly Mrs. Lillian Bonfils of Cleveland, whom he married in 1925, and by two children Glenn G. Brockway of Philadelphia and Mrs. Lillian B. Bairstow of Warren, whose mother died early in 1924.

Prices A Year Ago

Oct. 27, 1930

	Oklahoma	Penna.
58-60 U. S. Motor Gasoline	5.0000	6.75-7.00
Grade A Natural Gasoline	4.75	.....
Kerosine (Okla. 41-43; Pa. 47 w. w.)	3.125-3.50	5.375-5.75
Fuel Oil (Okla. 24-26; Pa. 36-40)	$0.60-$0.65	3.75-4.00
Crude (Okla. 35-35.9)	$0.92	$2.15
Chicago tank wagon (including 3c tax)		16.00c

Louis Walz, Veteran Pa. Refiner, Dies

CLEVELAND, Oct. 23.—Louis Walz, a figure in western Pennsylvania refining for more than half a century, died at Oil City, Pa., Oct. 15 and was buried there Oct. 17. Mr. Walz, 85 years old, was a director of the Pennzoil Co.

Mr. Walz was born in Germany, migrated to Titusville, Pa., in 1868 and later went to Oil City. He was carpenter and millwright but soon became interested in refining. He helped to form the Independent Refining Co. and later the Continental Refining Co.

In 1886 he sold out his interests in the latter and joined with Henry Suhr and Samuel Justus in organizing the Penn Refining Co. This subsequently consolidated with the Germania Refining Co. to form the Penn American Refining Co., now the Pennzoil Co.

Mr. Walz was vice president and general manager of the Penn American but retired from active service when the company was reorganized as the Pennzoil Co. He also was one of the organizers of the old Pure Oil Co. and United States Pipe Line Co., elements which later went into the present Pure Oil Co.

Late Market Changes

CLEVELAND—Oct. 27 Standard Oil Co. of Ohio advanced service station price of gasoline 1 cent through Ross county bringing prices there in line with the Ohio statewide schedule. Its new price for Sohio X-70 is 17 cents, and for Hi-So Green gasoline, 15 cents, including 4 cent tax.

Mid-Continent Refinery Markets

Refined and Natural Gasolines Advance

Staff Special

TULSA, Oct. 24

THE Mid-Continent gasoline market continued to gain ground rapidly in the week of Oct. 19 to 24.

Gasoline prices in virtually all districts advanced 0.375 to 0.625 cent a gallon depending on the grade. Advances of approximately 0.50 cent were made in U. S. Motor quotations in Oklahoma and Kansas, with advances of 0.25 to 0.50 cent reported generally in the other districts.

Refiners in Oklahoma and Kansas and the North Texas district reported contract movement was exceptionally good throughout the week. At the same time crude runs had been reduced sufficiently to keep the offerings in the open market at a small figure and the net result was a comparatively tight market, particularly in view of the fact that buying in the open market was in sufficient volume throughout the entire week to prevent any slack.

The East Texas refinery situation showed no change as far as gasoline supplies were concerned, and little gasoline was available in the Louisiana and Arkansas districts except at one or two plants.

This gasoline was absorbed by the market as rapidly as it appeared. Some of it was in the hands of brokers, and several refiners who had cut back crude runs and had been depending on the open market for their supplies of third grade gasoline turned to the brokers when they were unable to obtain their requirements from other refiners.

This buying apparently cleaned up all the gasoline in the hands of brokers in this area and the market was short of gasoline late in the week.

Efforts to obtain quotations for deferred shipment or for shipment over next month met with little success in the Mid-Continent. Refiners apparantly were more anxious to take their chances on a rising spot market rather than to commit themselves for any amount of gasoline at a flat price or even on a price reporting medium for the next several days.

Higher gravity gasolines were in active demand but little of those grades were available in the open market. Demand was stimulated somewhat by the relatively higher prices for natural gasolines as well as the scarcity of that material for blending. Many jobbers, as the cooler weather approached in the northern part of the territory, turned to the higher gravity straight run gasolines, but in most instances their deliveries hinged on the contracts they had with regular sources of supply.

Natural gasolines also experienced price advances of 0.25 to 0.50 cent gallon. Inquiries were numerous manufacturers said, and material late in the week was scarce for prompt shipment.

While much of the gasoline was bought for movement to the Gulf a considerable amount was bought by larger refiners in the middle west who apparently were preparing their winter fuels for quick starting. The Standard Oil Co. of Indiana has been one of the most consistent buyers recently, and reports here late in the week indicated refiners even in Ohio had turned to the Mid-Continent for supplies due to the scarcity of the material in the West Virginia area.

One of the larger manufacturers reported Oct. 23 that he was completely sold up until almost the middle of next month, but had received an inquiry for approximately 2,500,000 gallons. One or two manufacturers were reported to have oversold this month counting on increased production in the recently opened flush fields to take care of the orders, only to find they were forced into the open market in order to protect their customers.

The scarcity of the material in Texas also has been responsible for the prices in that district moving up on a level with the Oklahoma prices.

Kerosines were quiet in all districts but demand for heating distillates was brisk. Several sellers reported numerous inquiries for varying amounts of distillate, but for prompt and deferred shipment. Refiners who had the oil, however, were reluctant to sell any sizeable volume, believing that the first cold snap would cause prices to move up fractionally.

Zero gas oils also were in good demand and scarce in all districts with the possible exception of Louisiana and Arkansas. Many buyers continued to turn to those districts after unsuccessful attempts to obtain the oil in other areas of the Mid-Continent. Prices advanced fractionally in the course of the week.

Fuel oil demand showed some increase in Oklahoma. This was attributed in part to the turning to that district for fuel after supplies became limited in East Texas and the cooler weather restricted shipment. Prices for several grades advanced slightly.

Neutral oils and bright stocks prices marked time with demand reported only fair in most quarters. Wax also was unchanged both in price and demand.

Deep Rock Buys Outlet

KANSAS CITY—The Deep Rock Oil Corp. has taken over the bulk plants and businesses of the Stevens Oil Co., Springfield; Nevada-Lane Oil Co., Joplin; Bradfield Oil Co., Poplar Bluff; and the Williams Coal & Oil Co., Springfield, all in Missouri, in the past few weeks. Announcements were made in the bulletin of the Missouri Oil Men's Association.

TORONTO, Oct. 19.—A new gasoline, described as knockless, to be sold at the regular price has been placed on the eastern Canadian market by Supertest Petroleum Corp., Ltd. It is called Wonder gasoline.

The company reports a 15 per cent increase in sales to date compared with the corresponding period a year ago.

Voters Protest Gasoline Tax for Unemployed

NEW ORLEANS, Oct. 26.—Louisiana, already burdened with many parish taxes on gasoline, in addition to a 5-cent state tax, is now having proposed in one of its parishes a 1-cent levy on gasoline to aid the unemployed.

Its state tax already is used for a diversity of purposes, four-fifths of it going to the general highway fund, ½ cent to the state board of education, 9/20 cent to the board of commissioners of the Port of New Orleans and 1/20 cent to the board of commissioners of Lake Charles harbor. In addition, parish or county taxes are numerous, four parishes out of the six represented in the tank wagon table of National Petroleum News having these 1-cent parish taxes.

Ouachita parish is the one proposing the 1-cent levy on gasoline to provide funds for employment relief. This proposal received a setback when on Oct. 21 petitions bearing 1216 signatures, or more than the 10 per cent required by the Louisiana law, were filed with the parish police jury protesting the tax.

An election by the people is the only alternative now, according to the New Orleans Times-Picayune. Plans for such an election were being considered by the police jury at the end of last week.

Chicago Tank Car Market

CHICAGO, Oct. 24

SOME improvement was noted in spot gasoline demand during the closing days of last week. Demand from contract buyers was reported satisfactory by most sellers. Tank car gasoline prices continued to move higher and U. S. Motor, under 57 octane number was up 0.25 cent by the end of the week. Higher gravities remained comparatively scarce.

Kerosines were in steady demand with prices higher in some quarters. Distillates, gas and fuel oils were unchanged in demand, although a few grades were higher in prices.

Following prices represent majority of sales to jobbers on Group 3 freight basis, although shipments may originate in other refining districts, such as North, West and East Texas, Louisiana, Arkansas, Indiana, Illinois, Kentucky, etc.

	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
50-52, 437 e.p. naphtha	3.125– 3.25	2.75 – 3.00	2.75 – 2.875
U. S. Motor Gasoline:			
Below 57 octane number	3.75 – 4.00	3.50 – 3.75	3.125– 3.375
57-65 octane number	4.00 – 4.25	3.75 – 4.00	3.375– 3.625
Above 65 octane number	4.25 – 4.50	4.00 – 4.25	3.75 – 4.125
60-62, 437 e.p. gasoline	3.875– 4.00	3.50 – 3.75	3.375– 3.50
60-62 400 e.p. gasoline	4.00 – 4.25	3.625– 3.875	3.50 – 3.625
64-66 375 e.p. gasoline	4.50 – 4.625	4.00 – 4.125	3.75 – 4.00
68-70 350-360 e.p. gasoline	4.875– 5.125	4.75 – 5.00	4.50 – 4.75
*Domestic Aviation Gasoline	5.00 – 5.25	5.00 – 5.25	4.375– 5.00
41-43 w.w. kerosine	2.00 – 2.125	2.00 – 2.125	1.875– 2.00
42-44 w.w. kerosine	2.25	2.125– 2.25	2.00 – 2.125
38-40 p. w. distillate	1.75 – 1.875	1.625– 1.75	1.625– 1.75
38-40 straw distillate	1.75	1.625– 1.75	1.625– 1.75
32-36 ordinary dark gas oil	1.25 – 1.375	1.25	1.125– 1.25
32-36 dark zero gas oil	1.50 – 1.625	†1.50	†1.375– 1.50
32-36 straw zero gas oil	1.625– 1.75	1.50 – 1.625	1.50 – 1.625
28-30 zero fuel oil (per bbl.)	†$0.45 –$0.50	†$0.45 –$0.50	†$0.45 –$0.50
28-30 fuel oil (per bbl.)	$0.35 –$0.40	$0.35 –$0.40	$0.35 –$0.40
24-26 fuel oil (per bbl.)	$0.30 –$0.325	$0.30 –$0.325	$0.275–$0.325
18-22 fuel oil, (per bbl.)	$0.225–$0.25	$0.225–$0.25	$0.225–$0.25
18-22 zero fuel oil (per bbl.)	$0.275–$0.325	$0.275–$0.325	$0.275–$0.30
14-16 fuel oil (per bbl.)	$0.20 –$0.25	$0.20 –$0.25	$0.20 –$0.225

*Prices are based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167° F., and not less than 122° F.; 50% recovery at 221°; 90% at 311°; 96% at 347°; end point 374° F. Gasoline of fighting grade specifications in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

†Nominal.

Texas Marketers Urge Protective Measures to End Tax Dodging

SAN ANTONIO, Oct. 24

TEXAS gasoline tax officials will be asked by the Texas Petroleum Marketers Association to place a deputy tax inspector in every refinery in the state to check gasoline shipments to Texas distributing points. This move is planned as part of the association's campaign against tax evasion and its attendant unfair competition in the marketing of motor fuels.

The association is also enlisting the assistance of state, county and district school officials and the units of the Parent-Teacher organization in Texas because a fourth of the Texas tax recepits is appropriated to school purposes.

"Immediate and drastic action must be taken by law enforcement authorities to curb evasion of the gasoline tax," said W. C. Gaylor, Gaylor Oil Co., Houston, in opening the association's two-day convention here. Mr. Gaylor is president of the organization. "This practice has defiantly increased until it has become a dangerous national racket.

Since Texas began to collect taxes at the source of the gasoline last May instead of at distributing points, tax receipts have increased although consumption of motor fuel in the state has been less, Mr. Gaylor said.

Mr. Gaylor urged the compilation and dissemination of statistics which would give the industry adequate information to prevent periods of distress.

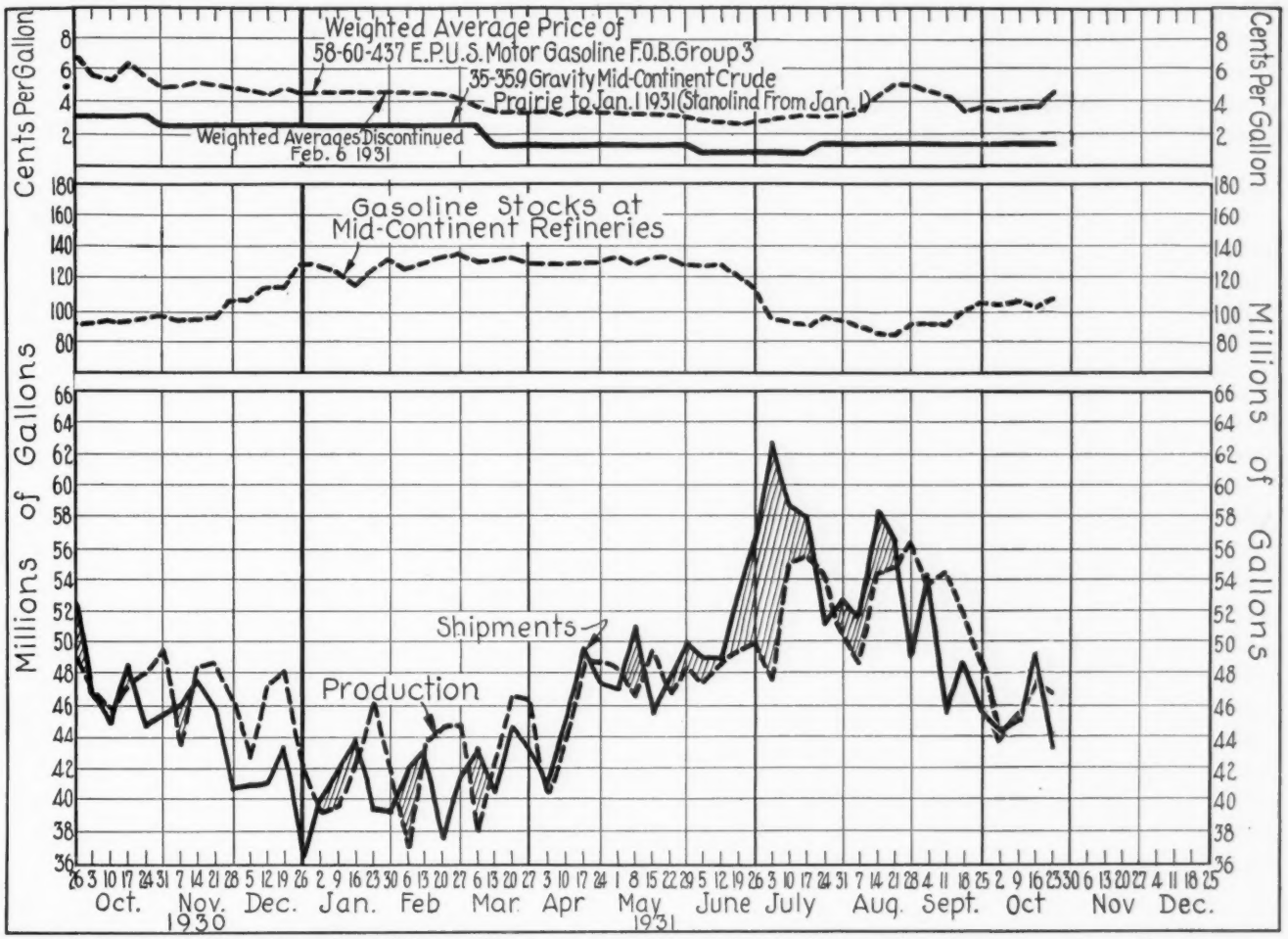
Mr. Gaylor also recommended research to develop new uses for petroleum products. He suggested that it would be money well spent if the oil industry would financially aid the chemistry department of every state university and school of technology to carry on experiments that might lead to discovery of new uses.

Mr. Gaylor was re-elected president of the Texas Marketers' association. Other officers elected are: Vice-presidents—Edgar J. Marston, Texas Pacific Coal & Oil Co., Fort Worth; E. H. Eddleman, American Refining Properties, Wichita Falls; George D. Bowers, Simms Oil Co., Dallas, and C. M. McNutt, McNutt Oil Co., El Paso, Chester A. Slimp, Slimp Oil Co., San Antonio, was re-elected secretary and L. H. Flinn, San Antonio, continues as managing director and counsel.

Directors elected are: E. H. Hefley, Mann-Hefley Oil Co., Corpus Christi; Frank P. Schneider,, Simms Oil Co., Dallas; S. H. Helton, Ranger Oil Co., Houston; Thomas Lombardo, Oleander Oil Co., Beaumont; A. M. Hughes, Phillips Petroleum Co., Amarillo; O. T. Davenport, Laurel Petroleum Co., San Antonio; John McCoy, Marathon Oil Co., Fort Worth; W. B. Ellis, Independent Oil Co., Hillsboro; Arthur Blohm, Blohm Oil Co., Temple; Edgar Little, Little Oil Co., Houston; G. W. Reed, Panhandle Refining Co., Wichita Falls, and John Cronin, Grayburg Oil Co., San Antonio. J. B. Russ, Consolidated Oil Co., Houston was elected chairman of the board.

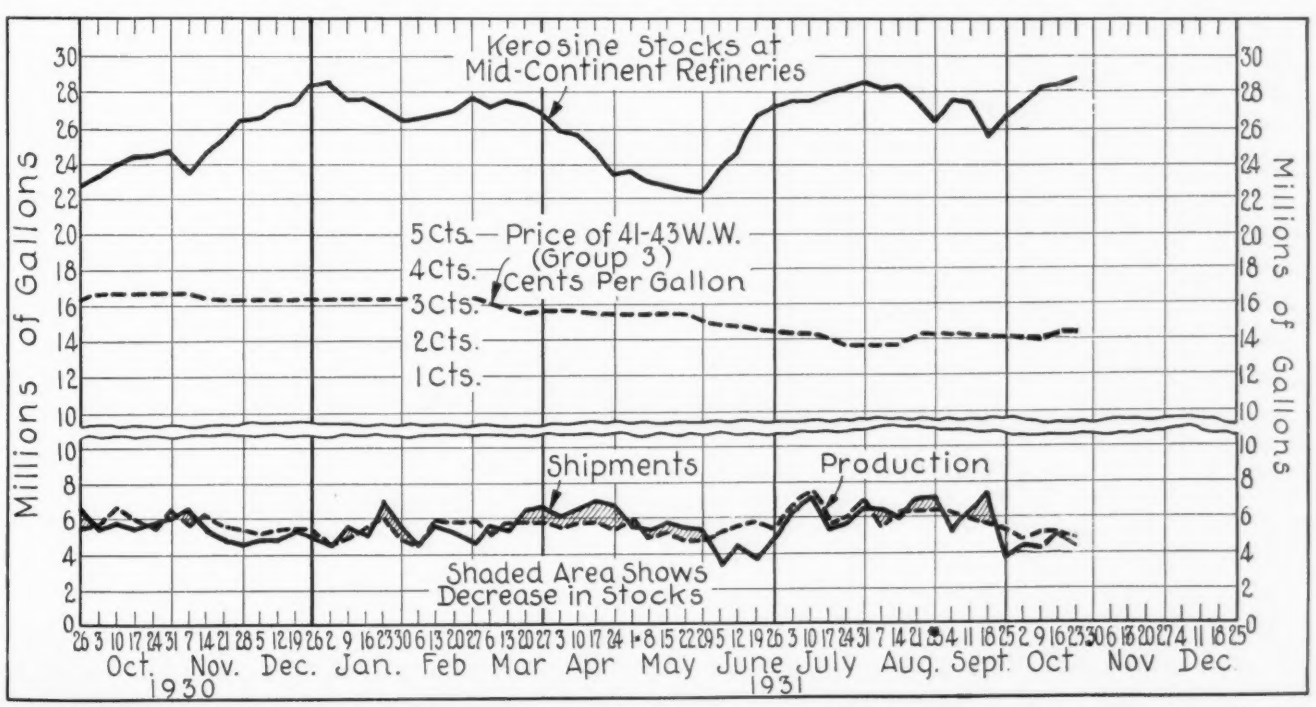
Barometer of Mid-Continent Refinery Market—Week Ending October 23

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News


Cents Per Gallon
Weighted Average Price of
58-60-437 E.P.U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude
Prairie to Jan. 1 1931 (Stanolind From Jan. 1)
Weighted Averages Discontinued Feb. 6 1931
Gasoline Stocks at Mid-Continent Refineries
Millions of Gallons
Shipments
Production
Oct. Nov. Dec. Jan. Feb Mar Apr May June July Aug. Sept. Oct Nov Dec.
1930
1931

Beginning Oct. 9, 1931, price on U. S. Motor gasoline is average of three grades, classified according to octane number: below 57 octane number, 57-65 octane, and above 65 octane number.

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date as shown in the table on page 130



Beginning Oct. 12, 1931, price on U. S. Motor gasoline is average of three grades, classified according to octane number: below 57 octane number, 57-65 octane, and above 65 octane number.

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where ɔ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted.

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
48-50 450 e.p. naphtha...	.....	Discontinued	†2.75
50-52 450 e.p. naphtha...	†3.00 – 3.25	†3.00	†2.75
56-58 450 e.p. gasoline...	.....	Discontinued	†3.125
58-60 450 e.p. gasoline...	.....	Discontinued	†3.125
U. S. Motor Gasoline			
Below 57 octane number	4.00 – 4.25	†3.75 – 4.00	†3.625
57-65 octane number....	4.25 – 4.50	†4.00 – 4.25	†3.875
Above 65 octane number	†4.75	†4.25 – 4.50	†4.00 – 4.125
60-62 437 e.p. gasoline	.....	Discontinued	3.625– 3.875
60-62, 400 E.P. Gasoline			
Below 57 Octane number	4.25 – 4.50	4.00 – 4.125	.....
57-65 Octane number....	4.50 – 4.75	4.125– 4.375	.....
Above 65 Octane number	4.75 – 4.875	4.375– 4.625	.....
64-66 390 e.p. gasoline	.....	Discontinued	4.00 – 4.25
64-66, 375 E.P. Gasoline			
Below 57 Octane number	4.625	4.375	.....
57-65 Octane number...	4.875	4.625	.....
Above 65 Octane number	†5.125	4.875	.....
68-70 350-360 e.p. gasoline	5.125– 5.375	†5.00 – 5.125	4.75
‡Domestic Aviation Gasoline.....	5.25 – 5.50	4.75 – 5.00	4.25 – 4.75

‡Prices based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167° F., and not less than 122° F.; 50% rec. at 221°; 90% at 311°; 96% at 347°; end point, 374°F. Fighting grade in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

52-54 Naphtha.....	4.25 – 4.50	4.25 – 4.50	4.25 – 4.50
54-56 Naphtha.....	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
58-60 U.S. Motor 437 e.p.	4.50 – 4.75	4.625– 4.875	4.625– 5.00
60-62 400-410 e.p. gasoline	4.625– 5.00	4.625– 5.00	4.75 – 5.125
64-66 390 e.p. gasoline...	5.00 – 5.25	5.00 – 5.25	5.125– 5.25
68-70 350-360 e.p.....	5.625– 6.00	5.625– 6.00	5.75 – 6.00

OHIO (Quotations of S. O. Ohio. 4c state tax to be added. Delivered any point in Ohio.)

U. S. Motor Gasoline...	7.75	7.75	8.00
60-65 Octane number...	8.00	8.00	....

KANSAS (F. o. b. refinery Kansas destination)

U. S. Motor Gasoline			
Below 57 Octane number	4.25 – 4.50	†4.00 – 4.25	†3.625– 3.75
57-65 Octane number....	†4.50 – 4.75	†4.25 – 4.50	†3.875– 4.125
Above 65 Octane number	†4.75 – 5.00	†4.50 – 4.625	†4.125– 4.25
60-62 437 e.p. gasoline..	.....	.....	3.75 – 4.00
60-62 400 e.p. gasoline...	4.50 – 4.75	4.25 – 4.50	3.875– 4.125
64-66 375 e.p. gasoline ..	4.75 – 5.00	4.50 – 4.75	4.25 – 4.50

†Nominal

NORTH TEXAS (F. o. b. North Texas refineries)

56-58 450 e.p. gasoline...	†3.50	†3.00	†2.75 – 3.125
58-60 450 e.p. gasoline...	†3.50	†3.00	†2.75 – 3.125
U. S. Motor Gasoline			
Below 57 Octane number	4.00 – 4.125	3.625– 3.75	3.375
57-65 Octane number..	4.25 – 4.375	3.875– 4.00	3.625
Above 65 Octane number	4.50 – 4.625	4.125– 4.25	3.875
60-62 400 e.p. gasoline...	4.25 – 4.75	3.875– 4.00	3.50 – 3.75
64-66 390 e.p. gasoline...	4.50 – 4.75	4.125– 4.375	4.00 – 4.25
64-66 375 e.p. gasoline	4.625– 4.875	4.25 – 4.50	4.125– 4.375
68-70 350-360 e.p. gasoline	4.875– 5.125	4.75 – 4.875	4.50 – 4.75

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

U. S. Motor Gasoline			
Below 57 Octane number	4.00 – 4.125	3.625– 3.75	.....
57-65 Octane number....	4.25 – 4.375	3.75 – 4.00	.....
Above 65 Octane number	4.50 – 4.625	4.00 – 4.25	.....

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

U. S. Motor Gasoline			
Below 57 Octane number	4.25	4.00	†3.375–3.625
57-65 Octane number....	†4.50	†4.25	†3.75 –3.875
Above 65 Octane number	†4.75	†4.50	†3.875–4.125

ARKANSAS (Ark., N. La. and Miss. destination)

U. S. Motor Gasoline			
Below 57 Octane number	4.25	4.00	†3.375– 3.625
57-65 Octane number...	†4.50	†4.25	†3.75 – 3.875
Above 65 Octane number	†4.75	†4.50	†3.875– 4.125

CALIFORNIA (3c tax to be added to California gasoline prices if used in state.)

54-58 U.S. Motor 437 e.p.	6.00 – 8.50	6.50 – 8.50	6.75 – 8.50
54-58 U.S. Motor, for outside state shipment....	5.75 – 6.50	5.75 – 6.25	5.75 – 6.50
58-61 375-400 e.p. gasoline	9.50 –10.50	9.50 –10.50	9.50 –10.50
42-45 Engine Distillate 445-480 e.p.....	7.00 – 8.00	7.00 – 8.00	7.00 – 8.00

†Prices nominal ††Only one refiner quoting *Quotations only

NATURAL GASOLINE

(Note: End point of all grades, not over 375F. Corrosion test adopted Oct. 1, 1927; A.S.T.M. Method D130-27T; doctor test, July 2, 1928.)

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
Grade AA, 80-87.9, 90% Recovery.....	4.75	4.25 – 4.375	4.25
Grade A, 72-79.9, 90% Recovery.....	†4.875– 5.00	†4.50	†4.375
Grade BB, 84-92, 85% Recovery.....	†4.75	†4.25 – 4.375	†4.25
Grade B, 76-83.9, 85% Recovery.....	†4.75	†4.25 – 4.375	†4.25
Grade C, 80-92, 78% Recovery	†4.75	†4.25 – 4.375	†4.25
Grade 26-70.....	4.75	4.25 – 4.375	4.25

NORTH TEXAS (F. o. b. Breckenridge)

Grade AA, 80-87.9, 90% Recovery.....	4.50 – 4.625	4.125– 4.25	4.00
Grade A, 72-79.9, 90% Recovery.....	†4.75	†4.25 – 4.375	†4.00 – 4.25
Grade BB, 84-92, 85% Recovery.....	†4.50 – 4.625	†4.125– 4.25	†4.00
Grade B, 76-83.9, 85% Recovery.....	†4.50 – 4.625	†4.125– 4.25	†4.00
Grade C, 80-92, 78% Recovery	†4.50 – 4.625	†4.125– 4.25	†4.00
Grade 26-70.....	4.50 – 4.625	4.125– 4.25	4.00

NORTH LOUISIANA (F. o. b. Monroe District)

Grade AA.....	†4.75	†4.375	†4.25
Grade BB.....	†4.75	†4.375	†4.25
Grade C.....	†4.75	†4.375	†4.25

CALIFORNIA (F. o. b. California refineries)

75-85, 375-390 e.p. for blending.....	5.75 – 6.25	5.75 – 6.25	5.00 – 5.50

BURNING OILS

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

45 w.w. kerosine.....	3.625–3.75	3.625– 3.75	3.50 – 3.75
46 w.w. kerosine.....	3.75 –4.00	3.75 – 4.00	3.625– 4.00
47 w.w. kerosine.....	4.00 –4.25	4.00 – 4.125	3.875– 4.125

OKLAHOMA (F. o. b. Oklahoma refineries)

41-43 w.w. kerosine.....	2.00 – 2.25	2.00 – 2.25	1.875– 2.125
42-44 w.w. kerosine.....	2.125– 2.375	2.125– 2.375	2.00 – 2.25

KANSAS (F. o. b. refinery Kansas destination)

41-43 w.w. kerosine.....	2.375– 2.50	2.375– 2.50	2.375– 2.50
42-44 w.w kerosine.....	2.50 – 2.75	2.50	2.50

NORTH TEXAS (F. o. b. North Texas refineries)

40-42 w.w. kerosine.....	†2.00 – 2.125	2.00 – 2.125	1.75 – 1.875
41-43 w.w kerosine.....	†2.125– 2.25	2.125– 2.25	2.00 – 2.125

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

41-43 w.w. kerosine.....	2.75	2.50 – 2.75	2.25 – 2.50

ARKANSAS (Ark., N. La. and Miss. destination)

41-43 w.w. kerosine.....	2.75	2.50 – 2.75	2.25 – 2.50

CALIFORNIA (F. o. b. California refineries)

38-40 w.w. kerosine.....	4.00 – 5.00	4.00 – 5.00	4.00 – 5.00

NEUTRAL OIL

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

Vis.			(Viscosity at 70° F.)
200 No. 3 color, 420-425 flash.....	21.50 –22.00	21.50 –22.00	21.50 –22.00
180 No. 3 color, 410-415 flash.....	†19.50 –20.00	†19.50 –20.00	†19.50 –20.00
150 No. 3 color, 400-405 flash.....	17.50 –18.00	17.50 –18.00	17.50 –18.00

Note: Refiners Oct. 19 quoted 5 to 8c higher for 0 to 10 pour test oils; 3 to 5c higher for 10 to 15 pour test oils than prices shown above on this date.

****Prices represent quotations and sales**

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted.

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

****MID-CONTINENT** (F. o. b. Mid-Continent refineries)

Vis. Color	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
	(Viscosity at 100° F.)		
100—No. 2	4.75	4.75	4.75
150—No. 3	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00
150—No. 4	6.25	6.25	6.25
180—No. 3	8.75	8.75	8.75
180—No. 4	8.00 – 8.25	8.00 – 8.25	8.00 – 8.25
180—No. 5	7.50	7.50	7.50
200—No. 3	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
200—No. 4	9.00 – 9.25	9.00 – 9.25	9.00 – 9.25
200—No. 5	8.50 – 8.75	8.50 – 8.75	8.50 – 8.75
220—No. 3	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
220—No. 4	9.00	9.00	9.00
220—No. 5	8.50	8.50	8.50
240—No. 3	11.00	11.00	11.00
240—No. 4	10.25 –10.375	10.25	10.25
240—No. 5	9.75	9.75	9.75
280—No. 3	12.00 –12.50	12.00	12.00
280—No. 4	11.00 –11.25	11.00 –11.25	11.00 –11.25
280—No. 5	10.75 –11.00	10.75 –11.00	10.75 –11.00

Note: Quotations for 0 to 10 cold test neutral oils are ¼ to ½c higher depending on the grade.

GULF COASTAL (F. o. b. Gulf Coastal refineries)

Vis. Color	Viscosity at 100° F., pour test 0)		
100—No. 2 Pale	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
200—No. 3 Pale	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
300—No. 3 Pale	8.00 – 8.25	8.00 – 8.25	8.00 – 8.25
500—No. 3½ Pale	9.00 – 9.25	9.00 – 9.25	9.00 – 9.25
750—No. 4 Pale	10.00 –10.25	10.00 –10.25	10.00 –10.25
1200—No. 4 Pale	12.00 –12.25	12.00 –12.25	12.00 –12.25
2000—No. 4-5 Pale	13.00 –13.25	13.00 –13.25	13.00 –13.25
200—No. 5½ Red Oil	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
300—No. 5½ Red Oil	7.00 – 7.25	7.00 – 7.25	7.00 – 7.25
500—No. 6 Red Oil	8.00 – 8.25	8.00 – 8.25	8.00 – 8.25
750—No. 6 Red Oil	9.00 – 9.25	9.00 – 9.25	9.00 – 9.25
1200—No. 5-6 Red Oil	11.00 –11.25	11.00 –11.25	11.00 –11.25
2000—No 5 Plus Red Oil	13.00 –13.25	13.00 –13.25	13.00 –13.25

CALIFORNIA (F. o. b. California refineries)

Vis. Color	(Viscosity at 100° F.)		
100—No. 3	8.00	8.00	8.00
200—No. 3	10.00	10.00	10.00
300—No. 3	10.50	10.50	10.50
450—No. 3	12.00	12.00	12.00
550—No. 3	13.50	13.50	13.50
600—No. 3	13.50	13.50	13.50
200—No. 5	10.00	10.00	10.00
300—No. 5	10.50	10.50	10.50
400—No. 5	12.00	12.00	12.00
500—No. 5	13.00	13.00	13.00
600—No. 5	13.50	13.50	13.50
700—No. 7	13.50	13.50	13.50

CYLINDER STOCKS

MID-CONTINENT (F. o. b. Mid-Continent refineries)

Prices represent quotations and sales).

190-200 Vis. D at 210° Brt. St.	20.50 –22.00	20.50 –22.00	20.50 –22.00
150-160 Vis. D at 210° Brt. St., 0-10 cold test	20.00 –20.50	20.00 –20.50	20.00 –20.50
150-160 Vis. D at 210° Brt. St., 10-25 cold test	19.50 –20.00	19.50 –20.00	19.50 –20.00
150-160 Vis. D Brt. Stock, 25-40 cold test	18.50 –19.00	18.50 –19.00	18.50 –19.00
150-160 Vis. E 210° Brt. St.	19.00	19.00	19.00
600 St. Ref. Olive Green	5.50 – 6.50	5.50 – 6.50	5.50 – 6.50
600 St. Ref. Dark Green	4.50 – 5.50	4.50 – 5.50	4.50 – 5.50
Black Oil	3.25 – 4.00	3.25 – 4.00	3.75 – 4.25

PENNSYLVANIA (F. o. b. Western Penna. refineries) (A.S.T.M. Tests)

600 Steam Refined, filterable	14.00 –15.00	14.00 –15.00	14.00 –15.00
650 Steam Refined	17.50 –18.00	17.50 –18.00	17.50 –18.50
600 Flash	20.00 –21.00	20.00 –21.00	20.00 –21.00
630 Flash	23.50 –24.50	23.50 –24.50	23.50 –24.50
600 Warren E	18.00 –18.50	18.00 –18.50	18.25 –18.50
Cold Test Stocks, 140-150 vis. at 210°, 540-550 flash,			
No. 8 color, 20 pour test and below	28.00 –29.00	28.50 –29.00	29.00 –29.50
No 8 color, 25 and 35 pour test	25.50 –26.00	26.00 –27.00	27.00 –28.00
No. 8 color, 40 pour test and above	†25.50 –26.50	†26.00 –26.50	†26.00 –28.00

WAX

PENNSYLVANIA (Per pound, F. o. b. New York)

122-124 white crude scale a.m.p.	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125
124-126 white crude scale, a.m.p.	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125

†Prices nominal ††Only one refiner quoting *Quotations only

****OKLAHOMA** (Per pound in barrels; in a few instances, per pound in burlap bags; F. o. b. Oklahoma refineries.)

	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
124-126 White Crude Scale, a.m.p.	1.75 – 1.875	1.75 – 1.875	1.75 – 1.875

DISTILLATE, GAS AND FUEL OIL

PENNSYLVANIA (For outside Pittsburgh district)

36-40 fuel oil	2.625– 3.00	2.75 – 3.00	2.75 – 3.00

OKLAHOMA (F. o. b. Oklahoma refineries)

38-40 straw distillate	1.75 – 1.875	1.75 – 1.875	1.625– 1.75
36-38 straw distillate	†1.625– 1.75	†1.625– 1.75	†1.50 – 1.625
32-36 straw gas oil	1.375– 1.50	1.375– 1.50	1.375– 1.50
32-36 straw gas oil zero	†1.625– 1.875	†1.625– 1.875	†1.625– 1.75
32-36 dark gas oil	1.375– 1.50	1.375– 1.50	1.25 – 1.50
32-36 dark gas oil zero	†1.625– 1.875	†1.625– 1.875	†1.50 – 1.625
28-30 zero fuel oil(per bbl.)	$0.50 –$0.525	$0.50 –$0.525	$0.50
28-30 fuel oil (per bbl.)	$0.40 –$0.45	$0.40 –$0.45	$0.40 –$0.425
26-28 fuel oil (per bbl.)	$0.375–$0.40	$0.375–$0.40	$0.375–$0.40
24-26 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.325–$0.375
22-26 fuel oil (per bbl.)	$0.325–$0.35	$0.325–$0.35	$0.30 –$0.325
18-22 fuel oil (per bbl.)	$0.30 –$0.325	$0.30 –$0.325	$0.275–$0.30
16-20 fuel oil (per bbl.)	$0.275–$0.30	$0.275–$0.30	$0.25 –$0.275
14-16 fuel oil (per bbl.)	$0.225–$0.25	$0.225–$0.25	$0.20 –$0.25

KANSAS (F. o. b. refinery Kansas destination)

38-40 straw distillate	2.00 – 2.125	1.875– 2.00	1.875– 2.00
36-38 straw distillate	1.875– 2.00	1.75 – 1.875	1.75 – 1.875
32-36 straw gas oil	1.75 – 2.00	1.75	1.75
18-22 fuel oil (per bbl.)	$0.35 –$0.40	$0.35 –$0.40	$0.35 –$0.40
10-14 fuel oil (per bbl.)	$0.325–$0.35	$0.325–$0.35	$0.325–$0.35

NORTH TEXAS (F. o. b. North Texas refineries)

38-40 straw distillate	†1.875	1.75 – 1.875	1.625– 1.75
38-40 p.w.treated distillate	†1.875– 2.00	1.875– 2.00	1.75 – 1.875
32-36 gas oil, cracked	1.25 – 1.375	1.25 – 1.375	1.25 – 1.375
32-36 St. reduced gas oil	1.25 – 1.375	1.25 – 1.375	1.25 – 1.375
24-26 fuel oil (per bbl.)	$0.35 –$0.375	$0.35 –$0.375	$0.325–$0.35
20-24 fuel oil (per bbl.)	$0.30 –$0.325	$0.30 –$0.325	$0.275–$0.325
18-22 fuel oil (per bbl.)	$0.275–$0.30	$0.275–$0.30	$0.25 –$0.30

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment

30-32 gas oil	†1.25 – 1.375	†1.125– 1.25	1.125– 1.25
28-30 zero gas oil	†1.25 – 1.375	†1.125– 1.25	1.125– 1.25
18-22 fuel oil (per bbl.)	$0.275–$0.30	$0.275–$0.30	$0.275–$0.325

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

32-36 gas oil	1.75	1.50 – 1.75	1.50 – 1.75
32-36 gas oil, zero	2.00	1.75 – 2.00	1.75 – 1.875
14-16 fuel oil (per bbl.)	$0.40 –$0.45	$0.375–$0.40	$0.40

ARKANSAS (Ark., N. La. and Miss. destination)

32-36 gas oil	1.75	1.50 – 1.75	1.50 – 1.75
32-36 gas oil, zero	2.00	1.75 – 2.00	1.75 – 1.875
28-30 gas oil	†1.75	†1.625– 1.75	1.50 – 1.75
20-24 fuel oil (per bbl.)	$0.50 –$0.55	$0.50 –$0.55	$0.50 –$0.55
9-12 fuel oil (per bbl.)	$0.375–$0.425	$0.35 –$0.40	$0.35 –$0.40
Black oil	3.00	3.00	3.00

CALIFORNIA (F. o. b. San Joaquin Valley. Nominal pipe line charge to San Francisco 24c per bbl. more and to San Pedro 20c per bbl. more.)

14-18 fuel oil (per bbl.)	$0.45 –$0.55	$0.40 –$0.55	$0.40 –$0.55
14-18 Bunker oil (per bbl.)	$0.50 –$0.75	$0.50 –$0.75	$0.50 –$0.75
30-34 gas oil (per bbl.)	$0.75 –$0.90	$0.75 –$0.90	$0.75 –$0.90
27 Plus Diesel oil (per bbl.)	$0.75 –$0.90	$0.75 –$0.90	$0.75 –$0.90

PETROLATUMS

PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. Penna. refinery. In tank cars ½c to ¾c per pound less.) Quotations are from majority of refiners.

Snow White	6.75 – 7.50	6.75 – 7.50	6.125– 7.50
Lily White	5.75 – 6.50	5.75 – 6.50	5.125– 6.50
Cream White	4.75 – 5.50	4.75 – 5.50	4.125– 5.50
Light Amber	2.625– 3.25	2.625– 3.25	2.625– 3.25
Amber	2.375– 3.00	2.375– 3.00	2.375– 3.00
Red	2.00 – 2.75	2.00 – 2.75	2.00 – 2.75

PETROLEUM COKE

****OKLAHOMA** (F. o. b. Oklahoma refineries)

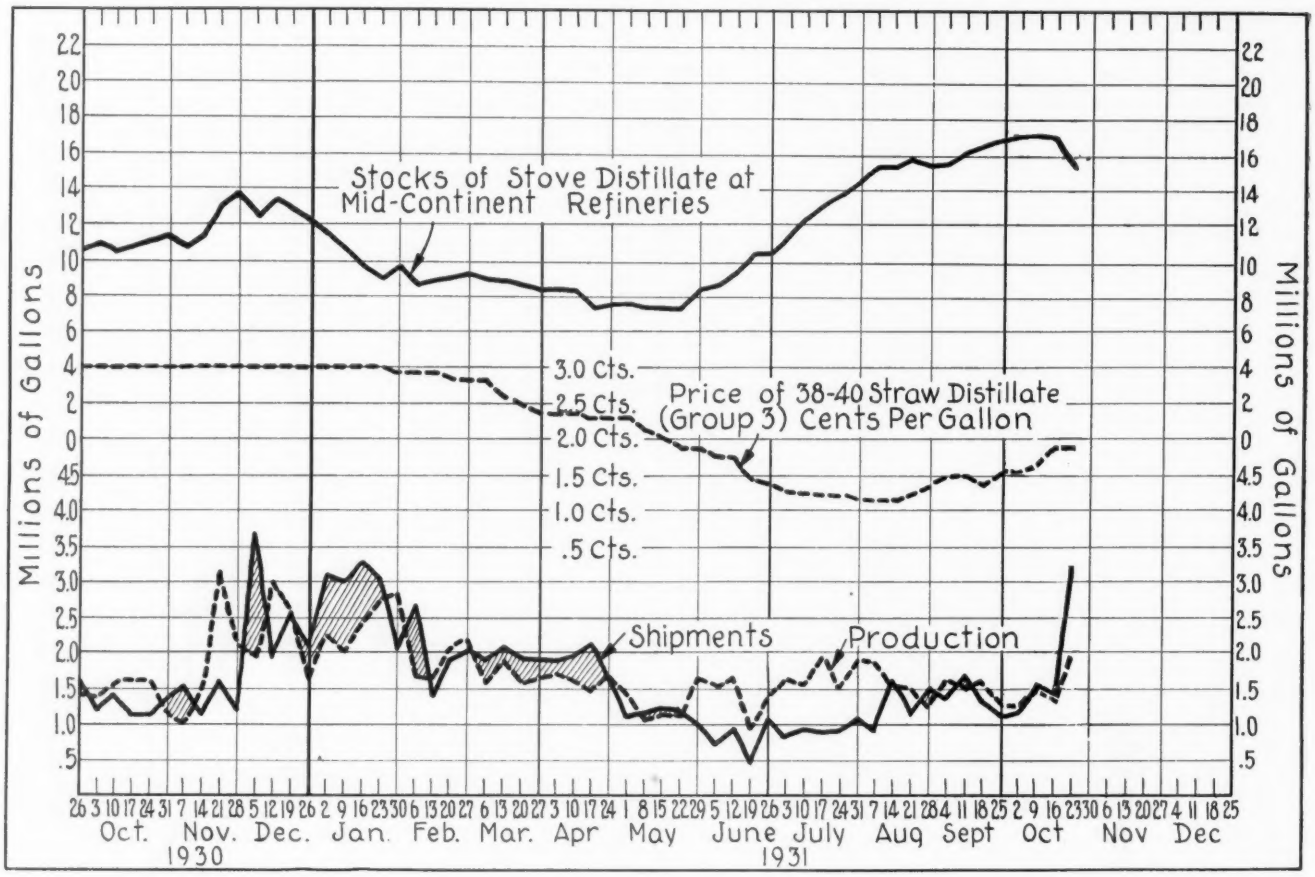
(Per ton in car lots)

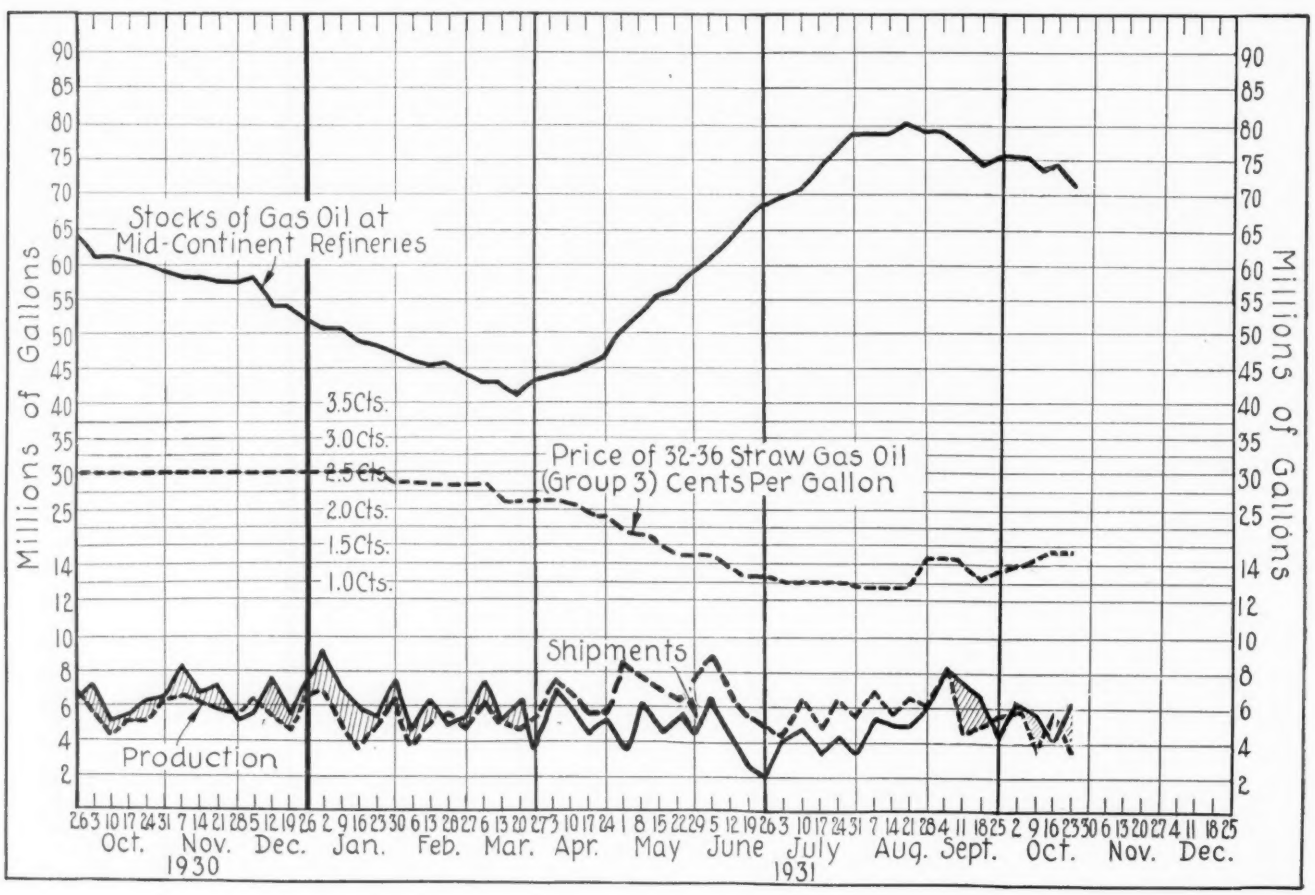
Lump	$3.00 –$4.00	$3.00 –$4.00	$3.00 –$4.00
Still run	$2.00	$2.00	$2.00 –$3.00
Breeze	$0.75 –$1.50	$0.75 –$1.50	$0.75 –$1.50

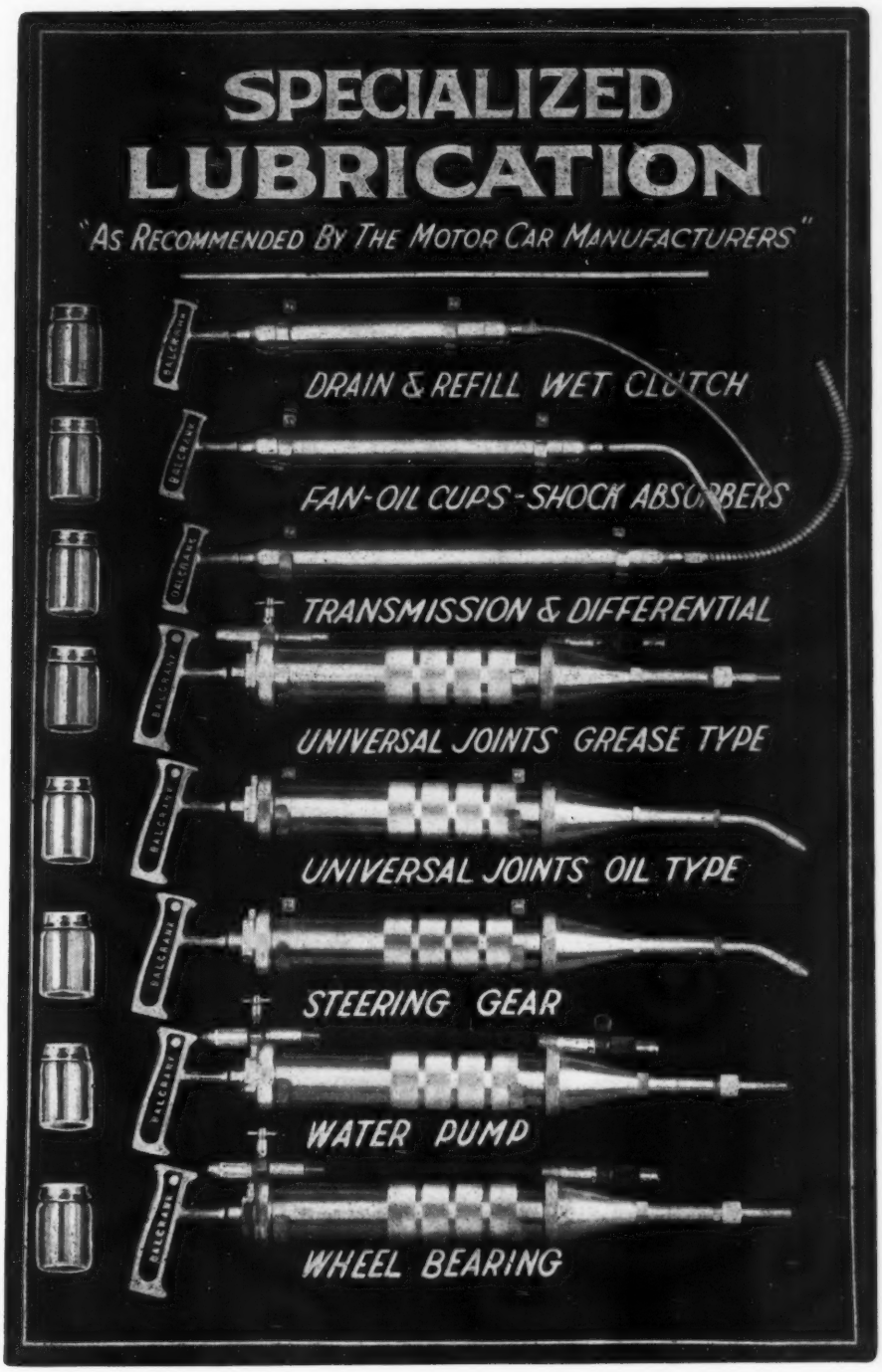
****Prices represent Quotations and Sales**

Barometer of Mid-Continent Refinery Market—Week Ending October 23

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News







These new Balcrank Push-Type Hand Guns are specifically designed to efficiently service ***every*** conceivable type of special lubrication, as recommended by the motor car manufacturers, for the maintenance of motor car efficiency, long life and ridability.

These eight new Balcrank Push-Type Hand Guns efficiently, and easily, perform every necessary type of specialized lubrication . . mounted on an attractive black and white porcelain enamel, beaded, all-metal exhibition board, with or without lubricant display jars. Dimensions are 58 x 34 inches. The attractiveness of this merchandising display, combined with the ease and efficiency of operation of each hand-balanced, knurled, hand gun, is certain to interest new customers and keep old customers repeating—These new units are another example of Balcrank's superior craftsmanship.

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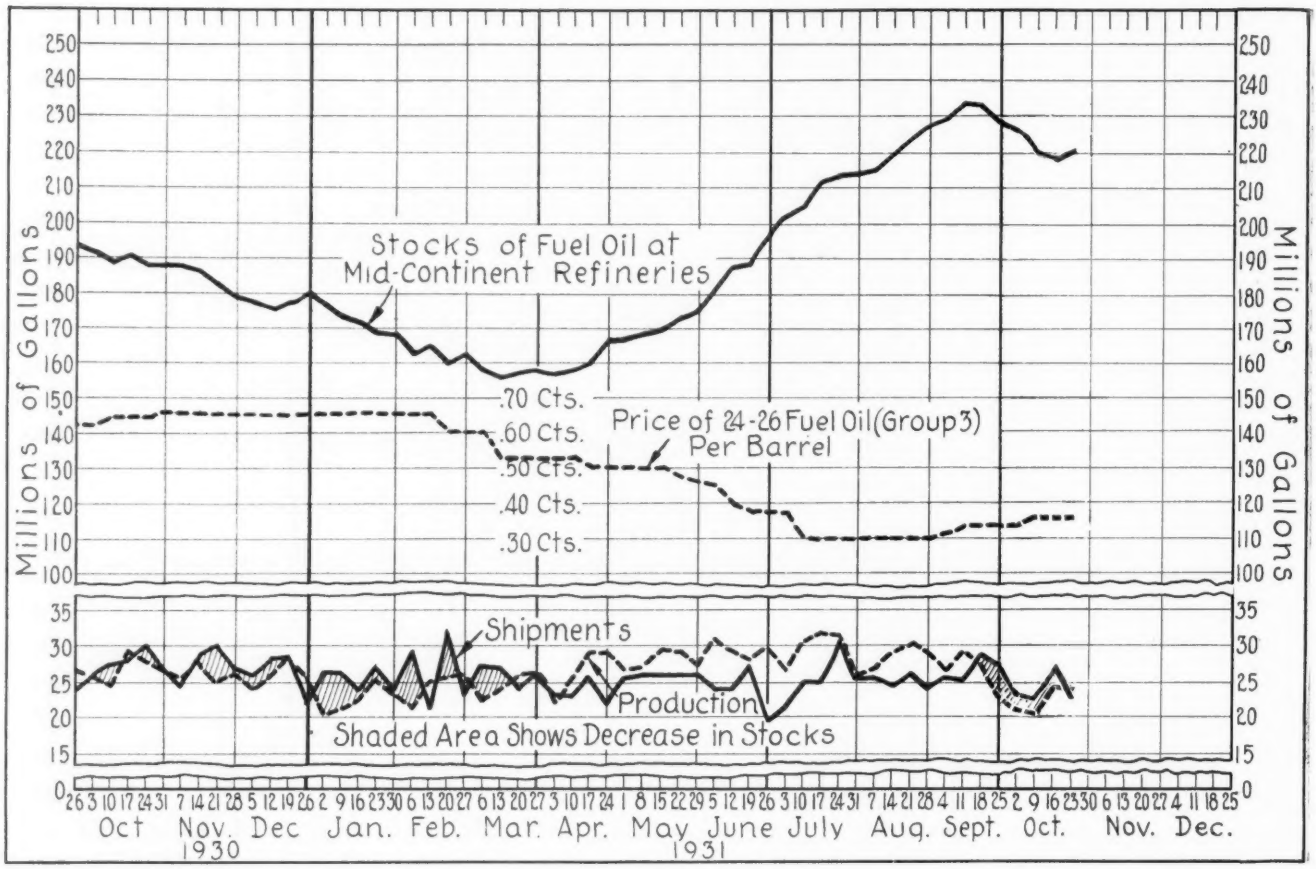
BALCRANK

Barometer of Mid-Continent Refinery Market—Week Ending October 23

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News



California Refinery Market

Prices Still Above Gulf Level

LOS ANGELES, Oct. 22

ALTHOUGH California exporters received only a few exploratory inquiries for bulk goods the past week, indications were that slightly higher quotations on several commodities at the Gulf would open the way for spot sales by local refiners.

East Coast buyers were still interested in quotations on cargo lots of gas oil and U. S. Motor gasoline. Offers ranged generally at $0.70 to $0.72 on the former and 4 to 4.25 cents c.i.f. on the latter. These offers did not interest local refiners.

In the opinion of traders, California quotations on gas oil are 5 to 10 cents a barrel too high to meet Gulf competition. This was substantiated the past week by a report that two cargoes of 31-32 gas oil were available on the Pacific Coast at a quotation of $0.80 with possibilities of shading to $0.78 or perhaps lower on a firm offer.

A Japanese buyer was reported seeking approximately 60,000 tons of Bunker C fuel oil and 25,000 tons of diesel oil for November lifting.

Larger suppliers were reported holding out for $0.58 to $0.60 for fuel. Indications were that it might be purchased from other sources at under $0.55. Scarcity of crude and fuel oil among independent refiners has created a firmer tone to the bunker oil market.

Local suppliers were quoting 13.25 cents c.i.f. on drum lots of U. S. Motor gasoline for delivery to Japanese ports, with buyers offering 12.75 cents. Under present freight rates this would net the refiner less than 5 cents, deducting 2.65 cents for freight and in excess of 5 cents for packing, container, insurance, and delivery. It was thought possible to get a c.i.f. quotation of 13 cents on a firm offer for this goods, although demand was mediocre.

In domestic markets, the anticipated improvement in southern California retail gasoline market has not taken place. Independent refiners continued to quote 9.25 to 10.50 cents for tank car or tank truck and trailer movement into Los Angeles Basin, with this spread shaded to slightly less than 9 cents when shipped to other points in the state outside the competitive areas. These prices include the state tax.

For movement into adjoining states, quotations ranged at 5.75 to 6.50 cents generally, with a range of 5.75 to 6 cents prevailing on shipments into Utah and Arizona. These prices are exclusive of tax.

Colder weather caused a better demand for heavy oils and resulted in a slight advance in current quotations. Fuel oil prices ranged at $0.45 to $0.55 in tank car lots, with the average nearer the top figure. Gas oil and diesel oils could be bought at $0.75 to $0.85, with some suppliers asking $0.90 to $0.95.

Natural gasoline demand remained good with spot tank car quotations at 5.75 to 6 cents.

Pennsylvania Markets

Kerosine Demand Improves

CLEVELAND, Oct. 26.—The Pennsylvania market was featureless throughout the past week. Although Atlantic Refining Co. reduced retail gasoline prices one cent in the eastern part of the state. Tank car markets were not greatly affected.

Gasoline prices were being shaded somewhat during the latter part of the week. Odd cars were reported going at 0.25 cent under the current market prices. The quantity available at these prices was small, however.

Kerosine showed signs of advancing in price according to the reports of most traders. Demand was considerably better.

Prices on fuel oil differed according to the field. Prices ranged from 2.625 to 3 cents. Several refiners reported industrial buyers were entering the market for this oil.

Little activity was noted in the steam refined market. Several brokers said more stock was being offered in the open market. The increased offerings did not have any effect on prices, however. Quotations remained firm.

Refiners and brokers were both marking time waiting to see what would develop in the next few days in the bright stock market. Neutral oils also were unchanged in demand.

Gasoline Taxes Produce $245,000,000

NEW YORK, Oct. 26.—Total revenue from state gasoline taxes the first six months of this year was $244,746,853, the American Petroleum Institute has been advised by the U. S. Bureau of Public Roads. This income represents an increase of $14,146,398 over the $230,600,455 revenue of the first half of 1930. It does not include county and city gasoline tax collections.

Gross taxes assessed prior to deduction of refunds totaled $260,871,050 compared with $243,100,002 in the corresponding period of 1930.

Gasoline gallonage taxed totaled 7,117,874,233, a gain of 208,011,157 gallons over the 6,809,963,076 gallons taxed the first half of 1930.

Collection costs and the amounts of gasoline tax income diverted to miscellaneous purposes declined. Collection costs dropped $172,304. Diversions declined $3,049,791.

NEW YORK—L. A. Potter, Barnsdall Refineries, Inc., and N. B. Curtice, The Pure Oil Co., both of Minneapolis, have been appointed members of the Minnesota Code Committee.

6th Winter...

PENNSYLVANIA LOW COLD TEST OILS

which pour below zero ... exclusively processed by methods culminating from 50 years of refining experience.

Free Flowing at Lowest Winter Temperatures

Viscosities	Pour Tests
50/55 @ 210	Below 0° F.
60/65 @ 210	Below 0° F.
75/80 @ 210	Below 0° F.
85/90 @ 210	Below 0° F.

Also Higher Viscosities If Desired

TANK CARS ONLY

FRANKLIN CREEK REFINERY at Franklin Pa.

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Eastern Domestic Markets

Gasoline Markets Unsettled

Staff Special
NEW YORK, Oct. 24

EASTERN gasoline markets became unsettled during the week ended October 24. Tank car prices were reduced in New England. Tank wagon and service station prices were cut 1 cent through eastern Pennsylvania except Philadelphia and Norristown. The marketing of third grade gasoline by major companies spread more widely in New England. Wholesale buying fell off appreciably in the key markets.

On October 22, the Atlantic Refining Co. cut tank wagon and service station prices 1 cent throughout eastern Pennsylvania except Philadelphia and Norristown. The battle for gallonage at the pumps between marketers with varied prices was given as the reason for the reduction of prices in eastern Pennsylvania.

The marketing of the third grade gasoline was extended more widely in the vicinity of Boston and Providence. This grade was not available in the wholesale market, and prices at the pumps were determined by the competitive conditions existing in the various localities.

Gasoline prices were fairly well maintained in the key markets at 5.25 cents for below 65 octane and 5.50 cents for above 65 octane. At New York harbor, Philadelphia and Baltimore, sales continued to be made on the basis of those prices. However, sales were not in sizeable volume. One supplier reported that buyers who usually purchased in four or five-car lots were now ordering one and two cars. Similar reports were heard in other markets.

The decrease in open market gallonage was attributed in some sections to the increased buying of the major companies' third grade.

Kerosine prices were up 0.25 cent to 5 cents in the New York and Philadelphia markets. The majority of sellers were likewise holding for 5 cents in the Baltimore market, although some material was available at lower prices.

Heating oils No. 1 and No. 2 were in better demand at Boston at unchanged prices. Prices were steady likewise at New York harbor, although the demand for these oils in this market has shown little improvement.

Bunker oil, Grade C, was posted at $0.60 per barrel throughout the week. Diesel oil was offered at $1.30 per barrel.

Gulf Coast Markets

Mixed Cargo Bought

Staff Special
NEW YORK, Oct. 24

CARGO markets at the Gulf were fairly active during the week just ended. A French buyer purchased gasoline and kerosine. Domestic buyers for higher octane gasoline. The inquiry for fuel oil was improved. Prices were generally steady.

On Friday, a large French buyer ordered a mixed cargo of gasoline and kerosine for November lifting. The selling prices were approximately 3.75 cents for U. S. Motor, 4 cents for 64-66, 375 end point, and slightly under 3.50 cents for the water white kerosine, and 3.25 cents for the prime white.

Negotiations for 65 octane gasoline in the domestic market revealed that prices were pegged at 4 cents. Cargo lots of No. 1 heating oil were quoted and purchased on the basis of 2.25 cents. Bunker oil, Grade C, was quoted at $0.38 per barrel. Offers of $0.35 per barrel were rejected.

The market for cased goods was quiet. No sales were reported. Prices were generally unchanged.

Burner Association Scores U. S. Heat Contracts

NEW YORK, Oct. 23.—Federal authorities were scored for their action in preventing oil burner manufacturers from bidding on heating contracts for government buildings at a meeting last week of the board of directors of the American Oil Burner Association.

Announcement of the meeting suggested that if government architects would not even give courteous replies to inquiries, perhaps other government agencies would be interested in investigating heating contract awards and the unnecessary waste of the taxpayer's money.

With a building and remodeling program of $500,000,000 to provide work for the unemployed, and since several millions of dollars of this sum will be spent for heating systems, the association believes the awarding of these contracts is important to heating equipment manufacturers.

The association announces that from evidence in the possession of its officers, and letters received from responsible government officials, that only one conclusion can be drawn—that the awarding of heating contracts is conducted in a high-handed manner.

"There is more than a hint of powerful interests at work seeking to influence official decisions in these matters," the announcement stated.

The heating award for the new parcel post building in New York was cited. A month before bids were scheduled an oil burner equipment manufacturer called the government's attention to newspaper stories that the heating system would be awarded to a steam corporation, the announcement continued.

A saving of $30,000 a year, over the rates filed for the steam company with a public service commission, were guaranteed by the oil burner manufacturer.

Repeated protests finally brought this reply from the office of the supervising architect in Washington: "The experience of this office in operating some 1500 buildings is considered to be sufficient guide in protecting the interests of the government in this respect."

The association closed its announcement by stating that all it asked was an equal chance with others to bid on contracts, but the reuest has been refused.

Wax Markets

Expect Orders Soon

NEW YORK, Oct. 24.—Trading in the wax markets at New York and New Orleans was at a standstill during the week just ended. A few scattered sales of scale waxes at 1.95 cents per pound were reported for domestic shipment. There was little or no interest in the refined grades. Inquiries from abroad were totally lacking. Prices were generally unchanged for both scale and refined grades.

Buyers in both foreign and domestic circles have been purchasing on a hand-to-mouth basis for almost two months. It was believed by some suppliers that buyers' inventories had just about reached the low mark and that sizeable orders would be placed soon.

On The Lazy Bench

No Hero Then

A man may smile in the face of death,
But there never will be found
A man who can draw a placid breath
When his garters are coming down.

—The Gas Line
West Penn Oil Co.

* * *

Mother always took good care of father. Every night she used to go through his pockets to see if he lost anything. Once he lost a boat for Milwaukee, but mother never knew it.

* * *

And did you hear of the stenog, who didn't mail the circular letters because she couldn't find any round envelopes?

* * *

Nobody Home

The only thing that shuts off any of the radios in our neighborhood is the appearance of an instalment collector.

—The Pure Oil News
The Pure Oil Co.

* * *

Rastus (stumbling upstairs at 3 a.m.) De old gray mare she ain't what she used to be.

Mandy (coldly)—But de old white mule still am.

—The Sohioan
Standard Oil Co. of Ohio

* * *

The Old Order Changeth

"Times certainly have changed," sighed Smith.

"How so?" asked Robnson.

"Why, at a little family party last night, the women talked politics while the man got off in a corner and exchanged recipes."

—The Pure Oil News
The Pure Oil Co.

* * *

Nurse—That man in room 345 is awfully low.

Doctor—Are you sure you didn't encourage him?

* * *

The Wife—Isn't that your eye doctor?

The Husband—I thought so until he sent in his bill. He's a skin specialist.

* * *

Some motorists are in such a hurry to get into the next county that they go right on into the next world.

* * *

"Have you ever heard the New York University Stein Song?"

"No. How does it go?"

"Goldstein, Silverstein, Finklestein —"

—The Pure Oil News
The Pure Oil Co.

* * *

Another girl who needs a great big hand is the one about to make a left turn.

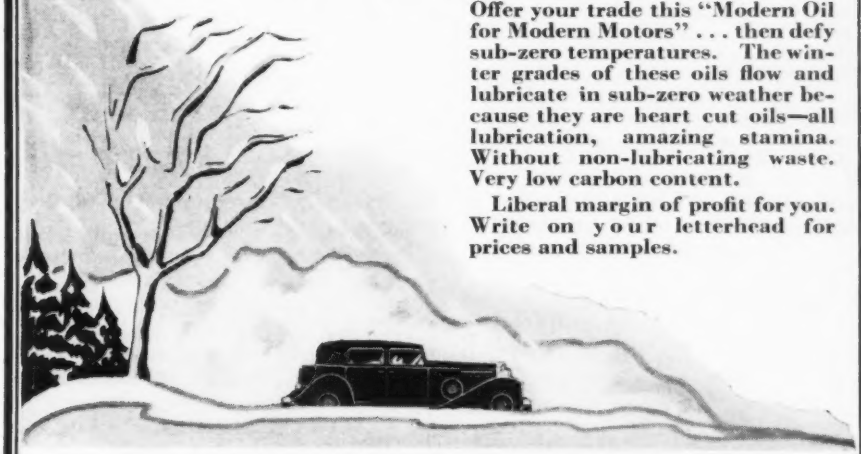
On the coldest day that blows

BURNHAM

"Tested"

PALES

will properly lubricate motors

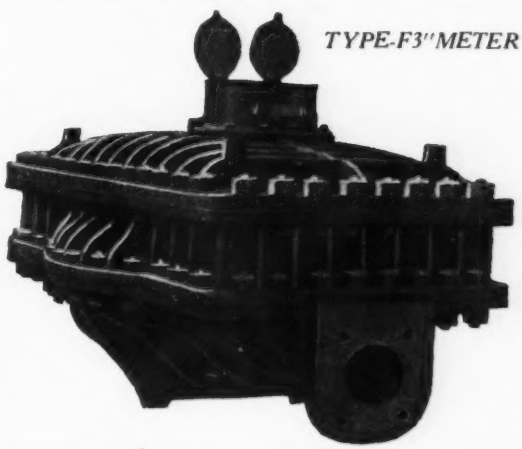


Offer your trade this "Modern Oil for Modern Motors" . . . then defy sub-zero temperatures. The winter grades of these oils flow and lubricate in sub-zero weather because they are heart cut oils—all lubrication, amazing stamina. Without non-lubricating waste. Very low carbon content.

Liberal margin of profit for you. Write on your letterhead for prices and samples.

CALUMET REFINING CO.
4323 SO. WESTERN BLVD., CHICAGO, ILL.
BRANCH OFFICE - GUARANTEE TITLE BLDG., CLEVELAND, OHIO.
REFINERY - BURNHAM, ILL.
Midcontinent and Pennsylvania Oils and Greases for all needs.

TYPE-F3" METER



LOADING RACKS
TANK CAR UNLOADING
TANK TRUCKS
WHARF SERVICE
ETC.

TABLE OF GRANBERG METER SIZES AND CAPACITIES*

Type and Size	Capacity Gals. per Minute	Working Pressures
C – 1" Bronze	3 – 25	45 – 60
D – 1½" Bronze (Light Case)	12 – 50	25 – 30
D – 1½" Bronze (Heavy Case)	12 – 50	50 – 70
DS – 1½" Bronze (For Truck)	12 – 80	50 – 70
ET – 2" Bronze (For Truck)	20 – 120	12 – 15
E – 2" Cast Iron	20 – 160	55 – 75
F – 3" Cast Iron	50 – 350	150

*Note the wide range of flow.

Literature mailed on request

GRANBERG METER CORPORATION
79 New Montgomery St., San Francisco, Calif.
AQUA SYSTEMS, INC., Distributors—2 Lafayette St., New York City
OILMEN'S SERVICE AND SUPPLY CO., Distributors—142 Berkeley St., Boston, Mass.
NATIONAL PUMPS CORP., Dayton, Ohio, Manufacturers of Granberg Meter Equipped Retail Pumps

Complete Seaboard Market

Export Markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the whole year

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of sales and quotations. Prices shown below do not include inspection tax levied in Florida and South Carolina.)

	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
U. S. MOTOR GASOLINE, Below 65 Octane Number			
New York harbor	5.25	5.25 – 5.50	5.50
Boston	5.625– 5.75	5.75	.....
Providence	5.625– 5.75	5.75	.....
Philadelphia District	5.25	5.25 – 5.50	5.50
Baltimore District	5.25	5.25 – 5.50	5.25 – 5.50
U. S. MOTOR GASOLINE, 65 Octane Number and Above			
New York harbor	5.50	5.50 – 5.75	5.75 – 6.00
Portland district	6.00	6.50	6.50
Boston district	5.75	6.25	5.75 – 6.25
Providence district	5.75	6.25	5.75 – 6.25
Philadelphia district	5.50	5.50 – 5.75	5.75 – 6.00
Baltimore district	5.50	5.50 – 5.75	5.75 – 6.00
Norfolk district	5.50	6.00	6.00
Charleston district	5.50	6.00	6.00
Savannah district	5.50	6.00	6.00
Jacksonville district	5.50	6.00	6.00
‡DOMESTIC AVIATION GASOLINE			
New York harbor	9.50 –12.00	9.50 –12.00	9.50 –12.00
Philadelphia	9.50 –12.00	9.50 –12.00	9.50 –12.00
Baltimore	11.00 –12.00	11.00 –12.00	11.00 –12.00
Boston	11.50 –13.00	11.50 –13.00	11.50 –13.00

‡Prices are based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167°F. and not less than 122°F.; 50% recovery at 221°; 90% at 311°; 96% at 347° end point 374°F. Gasoline of fighting grade specifications in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

WATER WHITE KEROSINE			
New York harbor	5.00	4.75 – 5.00	4.75 – 5.00
Philadelphia district	5.00	4.75 – 5.00	4.75 – 5.00
Baltimore district	4.875– 5.00	4.75 – 5.00	4.75 – 5.00
GAS OIL: 28-34 Gravity			
New York harbor	3.50	3.50	3.50
Boston district	3.75	3.75	3.75
FURNACE OIL: 36-40 Gravity			
New York harbor	4.50	4.50	4.50
Boston district	4.50	4.50	4.50
GRADE C BUNKER OIL (Lighterage 5c per bbl. additional)			
New York harbor	$0.60	$0.60	$0.70
Boston district	$0.60	$0.60	$0.70
DIESEL OIL			
New York harbor	$1.30	$1.30	$1.40

New York Export Market

(Lubricating oils are per gal. in bbls. F.a.s. New York)

	Oct. 26	Oct. 19	Oct. 12
CYLINDER OILS (Pennsylvania Products)			
Bright stock, No. 8 color	33.00 –34.00	33.00 –34.00	33.00 –34.00
Bright stock, No. 6½ color diluted	32.00 –33.00	32.00 –33.00	32.00 –33.00
600 D filtered	28.00 –29.00	28.00 –29.00	28.50 –29.00
600 Warren E filtered	24.00 –25.00	24.00 –25.00	24.50 –25.50
600 stm. refd. unfiltered	21.00 –23.00	21.00 –23.00	21.00 –23.00
650 stm. refd. unfiltered	23.00 –24.00	23.00 –24.00	23.00 –24.00
600 flash steam refined	25.50 –26.50	26.00 –27.00	26.00 –27.00
630 flash, steam refined	29.00 –30.00	29.00 –32.00	29.00 –32.00
RED PARAFFIN OILS (Vis. 100°)			
300 vis. No. 6½ color	15.00 –17.00	15.00 –17.00	15.00 –17.00
250 vis. No. 6 color	15.00 –16.00	15.00 –16.00	15.00 –16.00
200 vis. No. 6 color	13.00 –14.00	13.00 –14.00	13.00 –14.00
PALE PARAFFIN OILS (Vis. 100°)			
230 vis. No. 3¾ color	16.50 –17.00	16.50 –17.00	16.50 –17.00
180 vis. No. 3¼ color	15.00 –16.00	15.00 –16.00	15.00 –16.00
100 vis. No. 2¼ color	10.50 –11.50	10.50 –11.50	10.50 –11.50

Wax Market

(Prices in cents per pound, f. a. s. carload lots. Tests made by A. S. T. M. method with melting points converted into A. M. P. by adding 3° F.)

NEW YORK	Oct. 26	Oct. 19	Oct. 12
124-126 Yellow crude scale	1.90 – 1.95	1.90 – 1.95	1.90 – 1.95
122-124 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
124-126 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	2.875– 3.00	2.875– 3.00	2.875– 3.00
125-127 Fully refined	2.90 – 3.00	2.90 – 3.00	2.90 – 3.00
128-130 Fully refined	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
130-132 Fully refined	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
133-135 Fully refined	4.125– 4.25	4.125– 4.25	4.125– 4.25
135-137 Fully refined	4.375– 4.50	4.375– 4.50	4.375– 4.50
NEW ORLEANS			
124-126 Yellow crude scale	1.90 – 1.95	1.90 – 1.95	1.90 – 1.95
122-124 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
124-126 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	2.875– 3.00	2.875– 3.00	2.875– 3.00
125-127 Fully refined	2.90 – 3.00	2.90 – 3.00	2.90 – 3.00
128-130 Fully refined	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
130-132 Fully refined	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
133-135 Fully refined	4.125– 4.25	4.125– 4.25	4.125– 4.25

Gulf Coast Bulk Market

(Prices are f. o. b. Gulf oil terminals representing sellers' opinions covering bulk shipments of 20,000 barrels or more, for export and / or coastwise shipment unless otherwise noted.)

GASOLINE	Prices Oct. 26	Prices Oct. 19	Prices Oct. 12
U. S. Motor	3.75 – 4.25	3.75 – 4.25	3.75 – 4.25
60-62, 400 e.p.	3.875– 4.125	3.875– 4.125	3.875– 4.125
61-63, 390 e.p.	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
64-66, 375 e.p.	4.25 – 4.50	4.00 – 4.25	4.00 – 4.25
U. S. Motor, (cases cargoes)	$1.50	$1.50	$1.50
64-66, cases (cargoes)	$1.60	$1.60	$1.60
KEROSINE			
44 water white	3.50	3.50 – 3.75	3.75 – 4.00
41-43 prime white	3.25	3.25 – 3.50	3.25 – 3.50
Water white, cases (cargoes)	$1.40	$1.40	$1.40
Prime white, cases (cargoes)	$1.30	$1.30	$1.30
GAS & BUNKER OILS			
*26-30 translucent gas oil	2.125– 2.375	2.125– 2.375	2.125– 2.375
*30 plus translucent gas oil	2.25 – 2.50	2.375– 2.625	2.375– 2.625
Grade C bunker oil, for ships' bunkers, per bbl.	$0.45	$0.45	$0.55
Grade C bunker oil, per bbl. in cargoes	$0.38 –$0.43	$0.40 –$0.45	$0.40 –$0.45

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (f. o. b. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid, per bbl.	$0.45	$0.45	$0.45
Grade C bunker oil for bunkering, taxes paid, per bbl.	$0.55	$0.55 –$0.60	$0.55 –$0.60

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F. cold test 0 Tanker, f. o. b. Gulf oil terminals.)			
100 vis. No. 2 unfiltered pale	4.375– 4.50	4.375– 4.50	4.375– 4.50
200 vis. No. 3 unfiltered pale	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
300 vis. No. 3 unfiltered pale	7.625– 8.00	7.625– 8.00	7.625– 8.00
500 vis. No. 3½ unfiltered pale	8.25 – 8.75	8.25 – 8.75	8.25 – 8.75
750 vis. No. 4 unfiltered pale	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
1200 vis. No. 4 unfiltered pale	12.00 –12.50	12.00 –12.50	12.00 –12.50
200 vis. No. 5-6 red oil	5.25 – 5.75	5.25 – 5.75	5.25 – 5.75
300 vis. No. 5-6 red oil	6.25 – 6.75	6.25 – 6.75	6.25 – 6.75
500 vis. No. 5-6 red oil	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
750 vis. No. 5-6 red oil	8.25 – 8.75	8.25 – 8.75	8.25 – 8.75
1200 vis. No. 5-6 red oil	13.25 –13.50	13.25 –13.50	13.25 –13.50

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Oct. 26	Oct. 19	Oct. 12
Gasoline, U. S. Motor, 53-55 Gravity	3.50 – 4.25	4.25 – 4.50	4.25 – 4.50
Gasoline, U. S. Motor-blends and special cuts	4.50 – 5.25	4.50 – 4.75	4.50 – 4.75
Gasoline, 400 e.p. blend	4.75 – 5.50	4.75 – 5.25	4.75 – 5.25
Gas oil, 30-34 per bbl.	$0.78 –$0.90	$0.85 –$0.90	$0.85 –$0.90
Diesel Oil, 27 plus, per bbl.	$0.78 –$0.90	$0.85 –$0.90	$0.85 –$0.90
Bunker oil, 14-18 per bbl.	$0.55 –$0.70	$0.55 –$0.70	$0.55 –$0.70
Fuel oil, 14-18 per bbl.	$0.55 –$0.70	$0.55 –$0.80	$0.55 –$0.80
Kerosine, 38-40 w.w., 125-150 flash, per gal.	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
Cased Goods			
Gasoline, U. S. Motor	$1.45 –$1.55	$1.45 –$1.55	$1.45 –$1.55
Gasoline, 400 e.p. blend	$1.55 –$1.65	$1.55 –$1.65	$1.55 –$1.65
Kerosine, 38-40 w.w., 125-150 flash	$1.40 –$1.45	$1.40 –$1.45	$1.40 –$1.45

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to American ports, cents per barrel.)

	Oct. 26	
	Crude &/or Fuel	Refined Oil &/or Spirits
Calif. to U. K. or Continental ports*	†15	††15
Gulf to U. K. or Continental ports*	9	9
North Atlantic to U. K. or Continental ports*	7/6	7/6
Calif. to North Atlantic ports (not E. of N. Y.)	$0.45-$0.47	$0.45-$0.47
Gulf to North Atlantic ports (not E. of N. Y.)**	14-15	15

*Continental ports in the range between Bordeaux and Hamburg, both inclusive. **Venezuela loading same rate, for Tampico 2c to 3c per bbl. additional. †Last paid 12/6; owners ask 15. ††Last paid 11/6; owners ask 15.

The Black Diamond emblem is reproduced as depicted here, except that the word "Service" stands out on a green background. The Diamond itself is 28" wide and 17" high—the complete emblem and rugged iron standard is 48" high.

Jobbers and Refiners

Who Market "Unadvertised" Gas

The BLACK DIAMOND

Solves Your Problem

The Black Diamond emblem serves to identify the members of this Association with the Motoring Public. It is the "point of purchase" contact that ties up with an effective co-operative advertising campaign which includes the consistent use of radio, out-door and newspapers in the various trading areas where our members are located.

This emblem is available on an exclusive basis to Jobbers and Refiners to increase volume in established outlets and break down "unadvertised" sales resistance in setting up new locations. The Black Diamond merchandising service may be obtained at a remarkably low cost. Write us relative to your territory. Membership details on request.

THE INTERNATIONAL PETROLEUM ASSOCIATION, INC.
Guarantee Title Building, Cleveland, Ohio

REPUTATION GUARANTEE SATISFACTION

On good roads or bad roads, loaded or light, Brown tanks will remain tight. No secret reinforcements nor mysterious highsounding features. Just good honest full weight material correctly built by real tradesmen. The Brown Certified Truck Tank is the result of practical oil men's experience. From the oil man's standpoint, we offer just what you expect—efficient service—oil-tight at all times—and attractive appearance—priced right. Get our figures and compare the facts.

A 1650 gallon with stake barrel carriers and underslung canboxes

BROWN SHEET IRON & STEEL CO. **ST. PAUL, MINN.**

Canadian Associate: Canadian Brown Steel Tank Co., Ltd., Brandon, Manitoba

TEAR OUT THIS COUPON AND MAIL IT TODAY

Make of Truck..... **Size Tank Required**.....

Other equipment on which you may send prices.....

Name..... **Address**.....

Tank Wagon, Service Station Markets for Gasoline and Kerosine

(OIL PRICE HANDBOOK has t.w. and s.s. markets for a whole year, arranged for quick reference)

These Prices in Effect October 26, 1931, as Posted by Principal Marketing Companies

S.O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Atlantic City, N. J.	11.7	3	14.7	15.7	11.5
Newark, N. J.	10.7	3	13.7	14.7	10.5
Annapolis, Md.	11.2	4	15.2	16.2	11
Baltimore, Md.	10.4	4	14.4	15.4	8.5
Cumberland, Md.	12.2	4	16.2	17.2	12
Washington, D. C.	10.9	2	12.9	13.9	10.7
Danville, Va.	12	5	17	18	11.8
Norfolk, Va.	10.5	5	15.5	16.5	10.3
Petersburg, Va.	11.5	5	16.5	17.5	11.3
Richmond, Va.	10.9	5	15.9	16.9	10.7
Roanoke, Va.	12.2	5	17.2	18.2	12
Charleston, W. Va.	11.7	4	15.7	16.7	11.5
Keyser, W. Va.	12.3	4	16.3	17.3	12.1
Parkersburg, W. Va.	10.4	4	14.4	15.4	10.2
Wheeling, W. Va.	11.6	4	15.6	16.6	11.4
Charlotte, N. C.	11.5	6	17.5	17.5	11
Hickory, N. C.	12.8	6	18.8	19.8	12.6
Mt. Airy, N. C.	12.7	6	18.7	19.7	12.5
Raleigh, N. C.	12.4	6	18.4	19.4	12.2
Salisbury, N. C.	12.7	6	18.7	19.7	12.5
Charleston, S. C.	10.5	6	16.5	17.5	10.3
Columbia, S. C.	12.4	6	18.4	19.4	12.2
Spartanburg, S. C.	12.7	6	18.7	19.7	12.5

Discounts: gasoline, 2c per gallon discount off retail t.w. price to dealers thru S. O. New Jersey territory, except Maryland, New Jersey and Washington, D. C. where discount is 3c.

S. O. NEW YORK

Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	12.3	2	14.3	16.3	9
Borough of Richmond	12.7	2	14.7	16.7	11
Albany, N. Y.	11.6	2	13.6	14.6	10.5
Buffalo, N. Y.	11	2	13	13	10
Rochester, N. Y.	12	2	14	15	10
Syracuse, N. Y.	10.8	2	12.8	13.8	9.5
Boston, Mass.	10.5	3	13.5	14.5	10
Augusta, Me.	12.8	4	16.8	17.8	10.5
Manchester, N. H.	10	4	14	15	10
Burlington, Vt.	13.3	4	17.3	17.3	11
New Haven, Conn.	12.6	2	14.6	15.6	9
Providence, R. I.	10.1	2	12.1	13.1	10

Discounts: on gasoline 2c per gal. off posted t.w. price to dealers, thru territory, except 3c to dealers in New York City.

ATLANTIC REFINING

Pittsburgh, Pa.	11	3	14	15	11
Philadelphia, Pa.	10	3	13	13	11
Allentown, Pa.	10	3	13	14	11
Erie, Pa.	11	3	14	15	11
Scranton, Pa.	10	3	13	14	11
Altoona, Pa.	11	3	14	15	11
Dover, Del.	11	3	14	15	11
Wilmington, Del.	11	3	14	15	11
Boston, Mass.	10.5	3	13.5	14.5	10
Springfield, Mass.	9	3	12	13	10
Worcester, Mass.	11.3	3	14.3	15.3	10
Fall River, Mass.	9	3	12	13	10
Providence, R. I.	10.1	2	12.1	13.1	10
Hartford, Conn.	11	2	13	14	10
New Haven, Conn.	11.5	2	13.5	14.5	10
Atlantic City, N. J.	11.7	3	14.7	15.7	11.5
Camden, N. J.	10.8	3	13.8	14.8	10.6
Trenton, N. J.	11.2	3	14.2	15.2	11
Annapolis, Md.	11.2	4	15.2	16.2	11
Baltimore, Md.	10.4	4	14.4	15.4	8.5
Hagerstown, Md.	11.9	4	15.9	16.9	11.7
Richmond, Va.	10.9	5	15.9	16.9	10.7
Wilmington, N. C.	10.6	6	16.6	17.6	10.4
Brunswick, Ga.	11	6	17	17	*14
Jacksonville, Fla.	11	7	18	18	12

Discounts: on gasoline to dealers: "split dealers", 2c off posted t.w. price; to 100% dealers, 2.5c off t.w.; to authorized dealers (under lease 1c per gal.), 2.5c off posted s.s. price. To commercial accounts under contract for one year: for s.s. delivery, 1c per gal. off posted s.s. price; for t.w. delivery, 2c off posted t.w. price.

*Georgia kerosine prices include 1c state tax.

S. O. OHIO

	Sohio	X-70			
Ohio statewide	12	4	16	17	13
Ashtabula, Clark, Defiance, Franklin, Fulton, Greene, Henry, Lucas, Marion, Miami, Summit, Preble, Ross, and Williams counties:	12	4	16	16	13
Butler, Montgomery and Pickaway counties	11	4	15	15	13

Latest Changes in Tank Wagon Prices

Gasoline

S. O. New York—T.w. and s.s. cut 1.4c, Manchester, to 14c and 15c respectively, including 4c tax, **Oct. 20.**

Atlantic Refining—T.w. and s.s. cut 1c, eastern Pennsylvania, affecting Allentown and Scranton, both to 13c and 14c respectively, including 3c tax, **Oct. 22.** Philadelphia and Norristown unchanged.

T.w. and s.s. cut 1.1c, New Haven, to 13.5c and 14.5c respectively, including 2c tax, **Oct. 19.**

T.w. and s.s. cut 2c, Brunswick, both to 17c, including 6c tax, **Oct. 13.**

S.s. only cut 3c, Jacksonville, to 16c, including 7c tax, **Oct. 16.**

S. O. Kentucky—Crown Gasoline: S.s. only cut 3c, Jacksonville, to 16c, including 7c tax, **Oct. 16.**

T.w. and s.s. cut 1c, Miami, to 17c and 18c respectively, including 7c tax, **Oct. 16.**

T.w. and s.s. cut 1c, Tampa, both to 17c, including 7c tax, **Oct. 17.**

Kyso Green: T.w. and s.s. cut 2c, Lexington, both to 14c including 5c tax, **Oct. 17.**

S. O. Indiana—T.w. only cut 1.8c, Minneapolis, to 13.4c, including 3c tax, **Oct. 20.**

S.s. only cut 1c, Bartlesville, to 15c, including 5c tax, **Oct. 9.**

Stanolind Blue: T.w. cut 2.8c, s.s. cut 1c, Minneapolis, both to 10.9c, including 3c tax, **Oct. 20.**

Correction, Stanolind Blue: S.s. price at Evansville has been 13c, including 4c tax, effective **Sept. 11.**

S. O. Nebraska—S.s. only cut 1.75c, McCook, to 16c, including 4c tax, **Aug. 1.**

S. O. Louisiana—S.s. only cut ½c, Alexandria, to 16c, including 6c tax, **Oct. 21.**

Blue Gas t.w. cut ½c, Lake Charles, to 13c, including 6c tax, **Oct. 24.**

Continental Oil—T.w. cut 1c, s.s. cut 4c, Cheyenne, both to 14c including 4c tax, **Oct. 17.**

Kerosine

S. O. Indiana—Kerosine t.w. cut 2.2c, South Bend, to 8c, **Oct. 12.**

Kerosine t.w. up 1.1c, Indianapolis, to 10.1c, **Oct. 13.**

***Hi-So Green (Third Grade)**

Ohio statewide (Not sold to consumers)				15	13

***Sells generally 2c under s.s. price of Sohio X-70. To resellers, discount is 1½c below Hi-So Green s.s. price.**

Discounts: on Sohio X-70 gasoline, to dealers and commercial consumers generally thru Ohio, 2c per gal. off t.w. price except in counties where prices are below statewide schedule discount is generally 3c.

S. O. KENTUCKY

Crown Gasoline

	T.W.	Tax	Total T.W.	S.S.	T.W.
Lexington, Ky.	11	5	16	17	12
Louisville, Ky.	11	5	16	17	10
Paducah, Ky.	13	5	18	18	11
Covington, Ky.	12	5	17	18	11
Jackson, Miss.	10.5	5	15.5	15.5	11.5
Vicksburg, Miss.	9.5	5	14.5	14.5	11.5
Birmingham, Ala.	9.5	‡‡6	15.5	15.5	13
Mobile, Ala.	9	‡8.5	17.5	17.5	10
Montgomery, Ala.	13	*6	19	19	13.5
Macon, Ga.	13	6	19	19	†12
Atlanta, Ga.	12	6	18	18	*†12.5
Augusta, Ga.	13	6	19	20	†14
Savannah, Ga.	11	6	17	17	†12
Jacksonville, Fla.	11	7	18	16	12
Miami, Fla.	10	7	17	18	13
Tampa, Fla.	10	7	17	17	12
Pensacola, Fla.	12	**8	20	21	13

Kyso Green Gasoline

Lexington, Ky.	9	5	14	14	12

Kyso Green (Third Grade)

Lexington, Ky.	11	5	16	16	12
Louisville, Ky.	9	5	14	14	10
Paducah, Ky.	9	5	14	14	11
Jackson, Miss.	9	5	14	14	11.5
Vicksburg, Miss.	8	5	13	13	11.5
Birmingham, Ala.	8	‡‡6	14	14	13
Mobile, Ala.	7.5	‡8.5	16	16	10
Montgomery, Ala.	11.5	*6	17.5	17.5	13.5
Atlanta, Ga.	10.5	6	16.5	16.5	*†12.5
Macon, Ga.	11.5	6	17.5	17.5	†12

Discounts: on gasoline, 2c per gal. off t.w. price to dealers thru S. O. Kentucky territory.

*Montgomery gasoline tax includes 5c state tax, and 1c local privilege tax. Kerosine price includes ½c tax.

†Georgia kerosine prices include 1c state tax.

**Pensacola gasoline tax includes 7c state tax and 1c city tax.

‡Mobile gasoline tax includes 5c state tax, 1c city tax and 2.5c Mobile County tax.

‡‡Birmingham gasoline tax includes 5c state tax and 1c city tax.

*†3c discount off t.w. price of oil at Atlanta, meeting competition.

S. O. INDIANA

Red Crown Gasoline

Chicago, Ill.	11	3	14	14	9
Decatur, Ill.	11.4	3	14.4	14.4	9
E. St. Louis, Ill.	10.7	3	13.7	13.7	8.2
Joliet, Ill.	11.4	3	14.4	14.4	9
Peoria, Ill.	11.4	3	14.4	14.4	9
Quincy, Ill.	11.2	3	14.2	14.2	8.8
Springfield, Ill.	11.4	3	14.4	14.4	9
Indianapolis, Ind.	11.3	4	15.3	15.3	10.1
Evansville, Ind.	11.1	4	15.1	15.1	9.9
South Bend, Ind.	11.4	4	15.4	15.4	8
Detroit, Mich.	11.5	3	14.5	14.5	10.7
Grand Rapids, Mich.	11.7	3	14.7	14.7	10.6
Saginaw, Mich.	11.9	3	14.9	14.9	10.8
Marquette, Mich.	11.9	3	14.9	14.9	10.8
Green Bay, Wisc.	11.6	4	15.6	15.6	9.4
Madison, Wisc.	11.3	4	15.3	15.3	9.1
Milwaukee, Wisc.	11.1	4	15.1	15.1	8.9
La Crosse, Wisc.	12.2	4	16.2	16.2	10
Minneapolis, Minn.	10.4	3	13.4	13.4	9.9
Duluth, Minn.	12.5	3	15.5	15.5	9.9
Mankato, Minn.	12.1	3	15.1	15.1	8
Des Moines, Ia.	11.5	3	14.5	13.4	8
Davenport, Ia.	11.5	3	14.5	12.5	9.3
Sioux City, Ia.	11.1	3	14.1	14.1	8.9
Mason City, Ia.	11.5	3	14.5	14.5	9.3
St. Louis, Mo.	*10.4	2	12.4	12.4	8.3
Kansas City, Mo.	†11.9	2	13.9	13.9	7.6
St. Joseph, Mo.	† 9.4	2	11.4	9.4	7.5
Fargo, N. D.	13.9	3	16.9	16.9	11.9
Grand Forks, N. D.	14.2	3	17.2	17.2	12.2
Minot, N. D.	13.9	3	16.9	16.9	11.9
Pierre, S. D.	12	4	16	16	10.4
Huron, S. D.	12.3	4	16.3	16.3	10.7
Wichita, Kans.	9.8	3	12.8	12.8	7.8
Bartlesville, Okla.	8	5	13	15	7

*Includes city tax of ½c.
†Includes city tax of 1c.

Above prices include these inspection fees on both gasoline and kerosine, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosine; Arkansas, 1/20c on both; Florida, 1/8c on both; Illinois, 3/100c on both; Indiana, 2/25c to 1/2c on both; Kansas, 3/50c on both; Louisiana, 1/32c on gasoline; Minnesota, 3/50c on both; Missouri, 1/50c to 1/2c on both; Nebraska 3/100c on both; North Carolina, 1/4c on both; North Dakota, 1/20c on both; Oklahoma, 4/25c on both; South Carolina 1/8c on both; South Dakota, 1/10c on both; Tennessee, 2/5c on gasoline and 1/2c to 4/5c on kerosine; Wisconsin, 1/25c on both.

Kerosine inspection fees only, per gallon: Iowa 7/100c; Michigan, 1/5c to 4/5c per gal.

Tank Wagon, Service Station Markets for Gasoline and Kerosine

These Prices in Effect October 26, 1931, as Posted by Principal Marketing Companies

Stanolind Blue Gasoline

Stanolind Blue prices are 1.5c per gal. under Red Crown, except at following points:

Peoria, Ill.	9.9	3	12.9	12	9
Quincy, Ill.	8.2	3	11.2	12.7	8.8
St. Joseph, Mo.	†5.9	2	7.9	7.9	7.5
St. Louis, Mo.	*8.9	2	10.9	10.9	8.3
Detroit, Mich.	10.3	3	12.5	12.5	10.7
Grand Rapids, Mich.	10.2	3	13.2	12.2	10.6
Wichita, Kans.	8.3	3	11.3	9.8	7.8
Minneapolis, Minn.	7.9	3	10.9	10.9	9.9
Evansville, Ind.	9.6	4	13.6	13	9.9
Davenport, Ia.	10	3	13	10.9	9.3
Des Moines, Ia	10	3	13	10.9	8
Sioux City, Ia.	9.6	3	12.6	9.9	8.9
La Crosse, Wisc.	10.7	4	14.7	14	10

†Includes city tax of 1c.
*Includes city tax of ½c.

Discounts: Q.D.A., effective May 11, 1931, on gasoline: **To re-sellers,** thru territory, except Chicago:

Under 75,000 gals., off service station price: Ethyl, 3c, Red Crown, 2.5c, and Stanolind Blue, 1.5c per gal.; 75,000 gals. and over, off tank wagon price: Ethyl, 4c, Red Crown, 3.5c, and Stanolind Blue, 2c.

In Chicago, in any quantity, discounts are 4c per gal. on Ethyl gasoline, 3.5c on regular motor fuel grades and 2c on "third" grades, by principal marketing companies, discounts being off service station prices in quantities up to 75,000 gallons, and off t.w. price in quantities of 75,000 gallons and over.

To consumers, thru territory, except Chicago:

1,000 to 75,000 gals., off tank wagon price: Ethyl, 3c; Red Crown, 2.5c; and Stanolind Blue, 1.5c; 75,000 gals. and over, off tank wagon price, Ethyl, 4c; Red Crown, 3.5c; and Stanolind Blue, 2c.

In Chicago, in quantities over 1,000 gallons: Ethyl gasoline, 4c; regular grades 3.5c; "third" grades 2c, all discounts being off tank wagon price.

S. O. NEBRASKA

Red Crown Gasoline

	T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Omaha, Neb.	11.25	4	15.25	16.25	9.25
McCook, Neb.	12	4	16	16	10.75
Norfolk, Neb.	11.75	4	15.75	16.75	9.75
North Platte, Neb.	12.75	4	16.75	17.75	10.5
Scottsbluff, Neb.	12	4	16	16	10.25

Nebraska Blue (Third Grade)

Omaha, Neb.	...	4	....	13.9	9.25

Discounts: on gasoline, to dealers, off normal service station prices; Red Crown Ethyl 3c; Red Crown 2.5c per gal.; Nebraska Blue, 1c

S. O. LOUISIANA

Standard Gasoline

	Posted Retail T.W.	Tax	Total Posted Retail T.W.	Posted Retail S.S.	Oil T.W.
Little Rock, Ark.	10.5	6	16.5	17.5	11
Alexandria, La.	10	*6	16	16	†12
Baton Rouge, La.	10	5	15	16	†12
New Orleans, La.	8.5	*6	14.5	14.5	*12
Lake Charles, La.	9	*6	15	15	†12
Shreveport, La.	10.5	5	15.5	16.5	†12
Lafayette, La.	10	*6	16	17	†12
Bristol, Tenn.	12	6	18	19	14
Chattanooga, Tenn.	12	6	18	19	12
Knoxville, Tenn.	12.5	6	18.5	19.5	13.5
Memphis, Tenn.	9.5	6	15.5	16.5	11
Nashville, Tenn.	11.5	6	17.5	18.5	12.5

Blue-Gas (Third Grade)

	Tax	Total Posted Retail S.S.	Oil T.W.
Little Rock, Ark. ...	6	 12	11
Alexandria, La. ...	*6	.... 14.5	†12
Baton Rouge, La. ...	5	.... 11.75	†12
New Orleans, La. ...	*6	.... 12.5	*12
Lake Charles, La. ...	*6	 13	†12
Shreveport, La. ...	5	 12	†12
Chattanooga, Tenn. ...	6	 17	12
Knoxville, Tenn. ...	6	 17	13.5
Memphis, Tenn. ...	6	 15	11
Nashville, Tenn. ...	6	 14	12.5

Discounts: on gasoline and kerosine, in S. O. La. territory: To dealers and commercial consumers from the tankwagon, 2c per gal. off posted retail tank wagon price.

*Lake Charles, Alexandria, New Orleans and Lafayette gasoline tax includes 5c state tax and 1c parish tax. New Orleans kerosine price includes 1c parish tax in addition to 1c state tax.

†Kerosine price in Louisiana includes 1c state tax.

MAGNOLIA PETROLEUM

Maximum Mileage Gasoline

	T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Muskogee, Okla.	7	5	12	14	8
Oklahoma City.	8	5	13	15	7
Tulsa, Okla.	8	5	13	15	8
Fort Smith, Ark.	10.5	†5	**15.5	16.5	**11
Little Rock, Ark.	10.5	6	**16.5	17.5	**11
Texarkana, Ark.*	8	*4	12	14	8
Dallas, Tex.	9	4	13	14	8
El Paso, Tex.	10	4	14	16	12
Fort Worth, Tex.	9	4	13	14	8
Houston, Tex.	8	4	12	14	11
San Antonio, Tex.	8	4	12	14	10

Third Grade Gasoline

Muskogee, Okla.	7	5	12	12	8
Oklahoma City.	8	5	13	13	7
Tulsa, Okla.	8	5	13	13	8
Fort Smith, Ark.	8	5	13	13	**11
Little Rock, Ark.	6	6	12	12	**11

*Within city of Texarkana, the state tax on gasoline is 4c per gal. conforming with the Texas state tax. In this district outside of the city the 6c Arkansas tax applies.

†Fort Smith gasoline prices include Oklahoma tax of 5c; outside Fort Smith, Arkansas tax of 6c applies.

**Less 2c to dealers.

CONTINENTAL OIL

Denver, Colo.	10	4	14	17	12.5
Pueblo, Colo.	8	4	12	15	12
Grand Junc., Colo.	13	4	17	20	14.5
Casper, Wyo.	10	4	14	17	10
Cheyenne, Wyo.	11	4	15	18	11.5
Butte, Mont.	12	5	17	20	16
Helena, Mont.	15	5	20	23	16
Salt Lake City, Utah.	13.5	4	17.5	20.5	16
Boise, Ida.	15.5	5	20.5	23.5	18
Twin Falls, Ida.	†15.5	5	†20.5	21	18
Albuquerque, N. M.	12	5	17	20	14

†2.5 per gal. off t.w. price at Twin Falls to dealers.

S. O. CALIFORNIA

	Tax	Tank Truck (Resale)	*Retail Prices	Oil
San Francisco, Cal.	3	13.5	16.5	15.5
Los Angeles, Cal.	3	13	16	15.5
Fresno, Cal.	3	13.5	16.5	17
Phoenix, Ariz.	5	14.5	16	20
Reno, Nev.	4	17.5	20.5	19
Portland, Ore.	4	15	18	16.5
Seattle, Wash.	5	16	19	20.5
Spokane, Wash.	5	19.5	22.5	20.5
Tacoma, Wash.	5	16	19	20.5

Discounts: none on gasoline. Tank truck prices are those to resale trade; wholesale prices are generally 6c above tank truck prices, except at Phoenix, 1c.

*Retail prices are those of Standard Stations, Inc., marketing subsidiary of the Standard Oil Co. of California.

CANADA

Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

Regular Gasoline

	T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Toronto	17.5	5	22.5	26	18.5
Ottawa	18.5	5	23.5	27	19.5
North Bay	21.5	5	26.5	32	22.5
Fort William	19.5	5	24.5	28	17
Border Cities, including Windsor	17.5	5	22.5	26	16.5

Third Grade Gasoline

Toronto	...	5	....	23.5	18.5

Regular Gasoline

MANITOBA

Winnipeg	19.5	5	24.5	28	13.5

SASKATCHEWAN

Regina	23.5	5	28.5	32.5	17

ALBERTA

Edmonton	24.5	5	29.5	33	18
Calgary	21	5	26	29.5	14.5

BRITISH COLUMBIA

Vancouver	21.5	5	26.5	27.5	22

QUEBEC

Montreal	18.5	5	23.5	27	19.5
Quebec City	20.5	5	25.5	29	21.5
Three Rivers	20.5	5	25.5	29	21.5

NEW BRUNSWICK

St. John	20	5	25	29	22
Moncton	20	5	25	29	22

NOVA SCOTIA

Halifax	20	5	25	29	22

PRINCE EDWARD ISLAND

Charlottetown	20	5	25	29	22

NAPHTHA PRICES

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	10.7	12.7	14.2
Detroit	13.4	14.9	15.7
Kansas City	†11.9	†13.4	†14.2
Milwaukee	12.4	*15.9	*16.7
Minneapolis	**16.7	**18.2	**19
St. Louis	11.6	13.1	13.9
New York		14	17
Boston		17	17

*Includes 2c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	9.00
Philadelphia district	9.00
Providence	9.50
Tank Wagon or Steel Barrels	
New York City	14
Syracuse	17
Rochester	14
Buffalo	‡14
Providence	17
Boston	17
Bridgeport	15
Newark	16
Philadelphia	13
Lancaster	17
Altoona	17
Baltimore	16

Note: 2c off above t.w. prices to large buyers in some instances.

‡Buffalo price is net.

Aviation Gasoline Prices

Following are tank wagon prices of aviation gasoline in principal marketing territories showing state and municipal taxes:

S. O. NEW JERSEY

Prices in Effect Oct. 26, 1931

	T.W.	Tax	Total T.W.
Newark, N. J.	14.9	*	14.9
Baltimore, Md.	15.2	4	19.2
Washington, D. C.	15	2	17

*New Jersey road tax of 3c does not apply on aviation gasoline, exemption being claimed at time of purchase.

All above prices are on Stanavo Aviation Gasoline

COLONIAL BEACON OIL CO.

New York City	16	2	18
Boston, Mass.	18	3	21

S. O. PENNSYLVANIA

Philadelphia, Pa.	15	3	18
Pittsburgh, Pa.	15	3	18
Altoona, Pa.	15	3	18

S. O. OHIO

	T.W.	Tax	Total T.W.
Thru Ohio	14	4	18

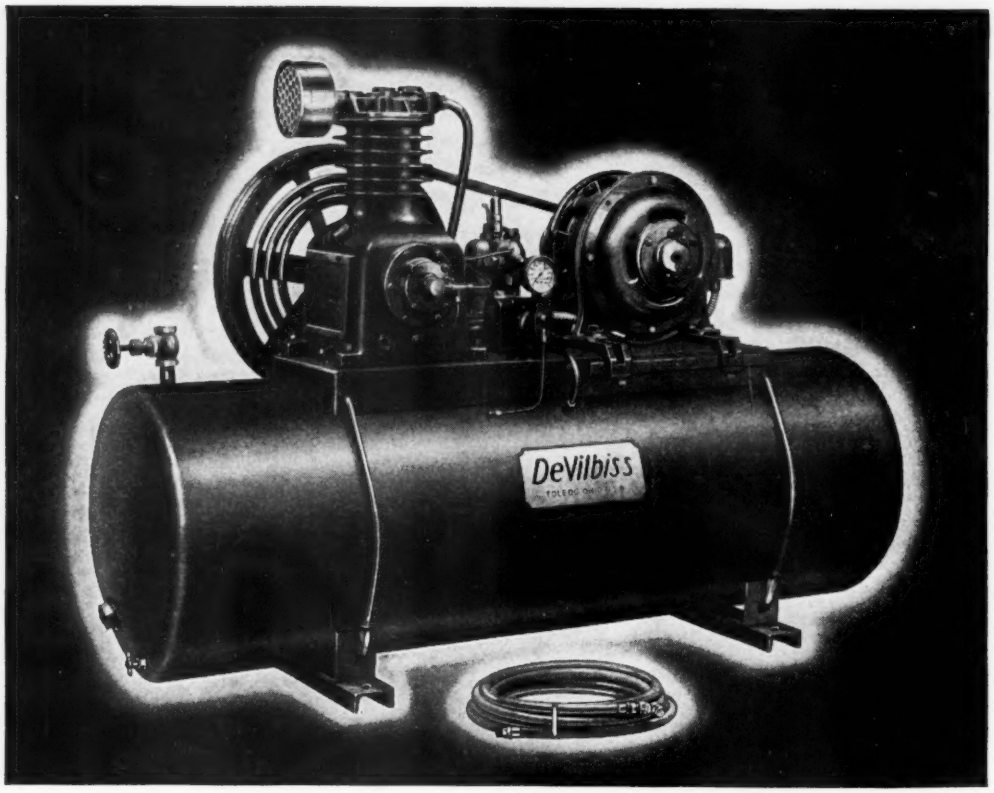
Discounts given by S. O. Ohio: For delivery to airports only; 2,000 gals. or over per month, 1c per gal.; 6,000 gals. or over per month, 2c; 12,000 gals. and over per month, 3c; 24,000 gals. and over per Month, 4c.

S. O. INDIANA

Chicago	14	3	17
Indianapolis, Ind.	14.3	4	18.3
Detroit, Mich.	14.8	3	17.8
Milwaukee, Wis.	14.1	2	16.1
Minneapolis, Minn.	15.2	3	18.2
St. Louis, Mo.	13.4	2.5	15.9
Kansas City, Mo.	13.9	3	16.9
Fargo, N. D.	16.9	3	19.9
Huron, S. D.	15.3	4	19.3
Wichita, Kan.	12.8	3	15.8

In S. O. Indiana territory, buyer pays state and city taxes on aviation gasoline, and if he can get a refund from the state, he does so. Kansas City tax of 3c includes 1c city tax; St. Louis tax of 2.5c includes ½c city tax.

(*Continued on Page 156*)



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DeVilbiss

Crude Oil Prices (in Effect Oct. 26, 1931)

Crude prices for the whole year in OIL PRICE HANDBOOK published annually

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(All Penna. Grade Crude except Corning, Effective Sept. 12, 1931)

Bradford—Alleghany district (Penna. and New York, posted by Tide Water Pipe Co., Ltd., effective Oct. 15, 1931) $2.15
Penna. Grade Oil in National Transit Lines.. *1.95
Penna. Grade Oil in Southwest Penna. Pipe Lines 1.80
Penna. Grade Oil in Eureka Pipe Lines (West Virginia) 1.70
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.) 1.60
Corning Grade in Buckeye Pipe Lines (Ohio).. 0.80 (Effective Sept. 16, 1931)
Ragland in Cumberland Pipe Lines (Kentucky) (Effective Jan. 9, 1929) $0.60

*Oil run prior to July 1, 1929 is 5c less per bbl.

Posted by Other Companies

Ashland Refining Co.:
Somerset in Cumberland lines (Kentucky) (Effective Sept. 26, 1931) $0.65
Stoll Oil Refining Co.:
Stoll Pipe Line Oil (Kentucky) (Effective Oct. 1, 1931) $0.50

MICHIGAN

(Posted by Pure Oil Co.)

Midland, Midland County (Aug. 23, 1931).. $0.73

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Effective Aug. 24, 1931

Wooster	$1.00	Princeton	$0.80
Lima	0.90	Illinois	0.80
Indiana	0.50	West Kentucky	0.75

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Effective Aug. 24, 1931

Petrolia, Ont. $1.80
Oil Springs, Ont. $1.87

Effective Aug. 25, 1931

Turner Valley, Alta.:

45-49.9	$2.08	50 and above	$2.65

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of *Stanolind Crude Oil Purchasing Co. (In Oklahoma, Kansas, North and North Central Texas)

Effective Aug. 22, 1931

Below 29	$0.46	35-35.9	$0.60
29-29.9	0.48	36-36.9	0.62
30-30.9	0.50	37-37.9	0.64
31-31.9	0.52	38-38.9	0.66
32-32.9	0.54	39-39.9	0.68
33-33.9	0.56	40 and above	0.70
34-34.9	0.58		

*Prairie Oil & Gas withdrew postings in Oklahoma, Kansas and Texas, Jan. 1, 1931.

Effective Aug. 22, 1931, above prices were met by these companies:

Humble Oil & Refining Co. in Ranger, North Texas, Moran, Mexia, Powell, Boggy Creek, Richland, Wortham and Currie.

The Texas Co., in Oklahoma, North Texas, North central and Central Texas and North Louisiana.

Carter Oil Co. in Oklahoma and Kansas.

Continental Oil Co., in Oklahoma, Kansas and North Texas.

East Texas

Discontinued by Humble, June 3.

Magnolia Petroleum Co.
(In Oklahoma, Kansas and Texas)

Effective Aug. 22, 1931

Oklahoma:

Cushing, Morrison, Oklahoma City, Seminole, Wewoka and Yale $0.68
Cement, Duncan and Walters 0.60
Healdton 0.37
Hewitt and Graham 0.52

Kansas:

Withdrawn July 22, 1931

Texas:

North and North Central:
Archer, Burkburnett, Comanche, Electra, Henrietta, Olden and Stephens $0.68
East Texas $0.68
East Central Texas:
Thrall (Effective July 24, 1931) $0.40
Central Texas:
Mexia, Wortham, Corsicana Light, Panola county and Lytton Springs $0.64
Corsicana heavy $0.34
Panhandle:
Gray county $0.58
Carson-Hutchinson counties $0.51
West Texas:
Crane, Upton, Howard, Glasscock, and Mitchell counties $0.35
South Texas:
Mirando $0.60
Darst Creek 0.52
Luling 0.34

Louisiana-Arkansas

Effective Aug. 24, 1931

North Louisiana:

Bull Bayou $0.68
Cotton Valley 0.46
Haynesville 0.50
Pine Island 0.58

Arkansas:

El Dorado and Rainbow $0.48
El Dorado, East Field (Calion) $0.45
Smackover $0.45

PANHANDLE TEXAS

Humble Oil & Refining Co.

Effective Aug. 22, 1931

Hutchinson-Carson Counties		Gray County	
Below 35	$0.41		$0.46
35-35.9	0.43		0.48
36-36.9	0.45		0.50
37-37.9	0.47		0.52
38-38.9	0.49		0.54
39-39.9	0.51		0.56
40 and above	0.53		0.58

Above prices met by The Texas Co. on Aug. 22 in Hutchinson, Carson and Gray counties.

WEST TEXAS and NEW MEXICO

Humble Oil & Refining Co.

Effective Aug. 22, 1931

Pecos, Winkler, Crane, Upton, Crockett, Ector, Howard and Glasscock Counties, Tex., and Lea county, N. Mex. $0.35

Aug. 22, 1931, The Texas Co. same prices in Crane, Upton, Winkler and Lea counties as Humble.

SOUTH and SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)

Effective Aug. 22, 1931

Mirando $0.60
Salt Flat 0.52
Darst Creek 0.52
Pettus, Bee County 0.70

(Posted by The Texas Co.)

Effective Aug. 22, 1931

Markham $0.52

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana

Caddo, Homer, Haynesville, Bull Bayou, El Dorado Crichton, De Soto, Sabine, Sarepta and Carterville.

Effective Aug. 24, 1931

Below 29	$0.46	35-35.9	$0.60
29-29.9	0.48	36-36.9	0.62
30-30.9	0.50	37-37.9	0.64
31-31.9	0.52	38-38.9	0.66
32-32.9	0.54	39-39.9	0.68
33-33.9	0.56	40 and above	0.70
34-34.9	0.58		

Smackover $0.45
*Urania, La. (Effective Aug. 24, 1931) 0.45
†Stephens, Ark.:
Below 29 ..... $0.41
29 and above 0.44

*Urania posted by Louisiana Oil Refining Corp.

†Stephens price effective Aug. 24, 1931 posted by Atlantic Oil Producing Co. and Louisiana Oil Refg. Corp.

*GULF COASTAL

Posted by Humble Oil & Refining Co.

Effective Aug. 22, 1931

Below 25	$0.55	30-30.9	$0.61
25-25.9	0.56	31-31.9	0.62
26-26.9	0.57	32-32.9	0.63
27-27.9	0.58	33-33.9	0.64
28-28.9	0.59	34-34.9	0.65
29-29.9	0.60	35 and above	0.66

Refugio heavy $0.60

*Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Mykawa, Orange, Pierce Junction, Raccoon Bend, Refugio light, Sour Lake, Spindletop, Sugarland and West Columbia.

The Texas Co. met above Gulf Coastal schedule Aug. 22, except that it posts these higher grades: 36-36.9, $0.67, 37-37.9, $0.68, 38-38.9, $0.69, 39-39.9 $0.70, 40 and above, $0.71.

Correction

About half of the copies of the Oct. 21, 1931, issue of NATIONAL PETROLEUM NEWS were run off last week without a tank car price being shown for U. S. Motor Gasoline in Ohio in the refinery market table on page 58 of that issue.

The price of U. S. Motor gasoline on Oct. 19 should have been published at 7.75 cents. The price of U. S. Motor gasoline, of 60-65 octane number was correct at 8.00 cents.

Crude Stocks Reduced in September

NEW YORK, Oct. 23.—Pipeline and tank farm gross domestic crude oil stocks east of the Rockies decreased 4,251,000 barrels in September, according to the American Petroleum Institute. This follows a decrease of 7,918,000 barrels in August.

Gordon Johnston Is Sales Agent

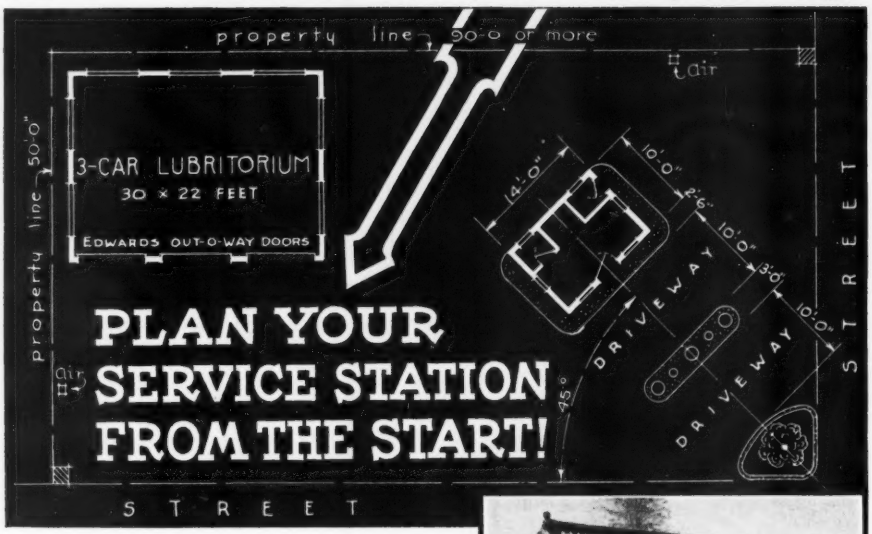
CLEVELAND — Gordon Johnston, formerly director of sales, United States Air Compressor Co., has recently been appointed exclusive Ohio distributor for the Brunner Manufacturing Co., Utica, N. Y., manufacturers of air compressors, car washer and paint spray equipment; for the Aro Equipment Corp., Bryan, O., manufacturers of lubricating equipment; and for the Globe Machinery & Supply Co., Des Moines, Ia., manufacturers of automobile hoists.

Mr. Johnston has a sales office at 787 Union Trust Bldg., and also a factory service in Cleveland.

TORONTO—The production of the Turner Valley, Alta. field in September, as marketed through the Imperial and Regal refineries in Calgary, was 66,595 barrels, compared with 66,795 barrels in August.

The Imperial refinery is accepting only half the production marketed in June.

Let EDWARDS



OFTEN the success or failure of the new service station hinges on the angle of the drive, the distance from the street, the placing of pumps, etc.

Edwards buildings and lot layouts are the result of thirty years scientific study . . . each one is planned right from the start to pay profits. Edwards Buildings are models of efficiency, beauty, with refinements that make future expansion economical and simple. The English model and three car lubritorium shown here is but an example of the many Edwards Buildings available for prompt delivery. Edwards Filling Stations, Lubritoriums, Parking Lot Offices, etc., are easy to erect, economical to buy and profitable to operate. Leaders in the industry have standardized on them for their sound practical values.

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Send for these OIL PRICE HANDBOOKS now, before they are all gone.

National Petroleum News, 735 Penton Bldg., Cleveland, Ohio

New Patents

Prepared by R. E. Burnham, patent and trade-mark attorney, 1343 H Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 20c each. State number of patent and name of inventor when ordering.

October 6, 1931

REFINING

Process of cracking mineral oil—Arthur E. Pew, jr., Bryn Mawr, and Henry Thomas, Ridley Park, Pa., assignors to Sun Oil Co., Philadelphia, Pa. Filed Aug. 18, 1928. No. 1,825,977.

Processes of refining hydrocarbon oils—Arthur Lachman, Berkeley, Calif., assignor to Richfield Oil Co., Los Angeles, Calif. Original application filed May 8, 1929, and following patents issued on division applications filed that date:

1,826,138. With Sulphonic-acid salts.
1,826,139. With copper salts.
1,826,140. With cadmium salts.
1,826,141. With mercury salts.
1,826,142. With iron salts.
1,826,143. With chromium salts.
1,826,144. With manganese salts.
1,826,145. With aluminum salts.
1,826,146. With nickel salts.
1,826,147. With cobalt salts.

Method of salvaging oil from sludge—Harold C. Eddy, Los Angeles, Calif., assignor to Petroleum Rectifying Co., same place. Filed Dec. 28, 1926. No. 1,826,276.

PRODUCTION

Casing-head — Alexander Boynton, San Antonio, Tex. Filed Nov. 21, 1927. No. 1,825,774.

Drilling-gead — William T. Dunn, Houston, and John E. Shows, Harrisburg, Tex. Filed Sept. 7, 1927. No. 1,826,059.

Apparatus for drilling wells—William J. Newman, Chicago, Ill. Filed Mar. 19, 1928. No. 1,826,087.

Crown-block—Harry P. Wickersham, Walnut Park, Calif., assignor to Baash-Ross Tool Co., Los Angeles, Calif. Filed June 11, 1929. No. 1,826,109.

Means for draining liquid from well-tubing—Paul H. Granger, Los Angeles, Calif. Filed Jan. 30, 1930. No. 1,826,-210.

Method of treating oil fields—Peter J. Spindler, Olean, N. Y. Filed Apr. 4, 1930. No. 1,826,371.

Well-drilling apparatus—Haskel A. Pippin, Okmulgee, Okla. Filed Dec. 16, 1930. No. 1,826,634.

Well-finishing tool—Ernest J. Carscallen, Mohall, N. Dak. Filed Nov. 22, 1930. No. 1,826,650.

MISCELLANEOUS

Liquid-dispensing apparatus—Walter E. Splain, Terrace Park, Ohio. Filed Sept. 18, 1928. No. 1,825,682.

Liquid-dispensing apparatus — Cornelius A. Desimone, Ventnor, N. J., assignor to John Wood Mfg. Co., Conshohocken, Pa. Filed Jan. 24, 1931. No. 1,826,204.

Liquid-dispensing apparatus—Reuben E. Bechtold, Fort Wayne, Ind., assignor to Tokheim Oil Tank & Pump Co. Filed July 18, 1930. No. 1,826,340.

Motor fuel—Daniel Stryker, White Plains, N. Y., assignor to Texas Co., New York, N. Y. Filed Dec. 21, 1927. No. 1,826,439.

October 13, 1931

REFINING

Art of cracking hydrocarbons—Eugene C. Hetthel, Chicago, Ill., and Harry L. Pelzer, Highland, Ind., assignors to Sinclair Refining Co., New York, N. Y. Filed June 11, 1927. No. 1,826,782.

Crude Oil Prices (in Effect Oct. 26, 1931)

(Prices are per barrel at the well)

(Crude Oil Prices for the whole year in OIL PRICE HANDBOOK published annually)

ROCKY MOUNTAIN FIELDS

(Posted by Midwest Refining Co.)

Effective Aug. 22, 1931

Salt Creek, Wyo.:

Below 29°	$0.46	32-32.9	0.54
29-29.9	0.48	33-33.9	0.56
30-30.9	0.50	34-34.9	0.58
31-31.9	0.52	35-35.9	0.60
36-36.9	0.62	39-39.9	0.68
37-37.9	0.64	40 and above	0.70
38-38.9	0.66		

Effective Aug. 24, 1931

Cat Creek, Mont.	$0.90
Hogback, N. Mex.	0.80
Hobbs, N. Mex.	0.35

(Posted by Ohio Oil Co.)

Effective Aug. 24, 1931

Elk Basin, Wyo.	$0.90
Grass Creek Light	0.90
Big Muddy	0.68
Lance Creek	1.05
Rock Creek	0.70
Sunburst, Mont.	0.90

CALIFORNIA CRUDE

††Standard Oil Co. of California

Effective June 19, 1931

Gravity	Signal Hil *Seal Beach *Alamitos Heights	Huntington Beach	Inglewood	Playa del Roy	Olinda-Brea Canon	Elwood Terrace	Torrance	Richfield	†Whittier †La Habra Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	**Athens **Rosecrans **Dominguez	**Santa Paula	**Orcutt
14-19.9	$0.65	$0.65	$0.65	$0.65	$0.65	....	$0.65	$0.65	$0.65	$0.65	....	$0.55	$0.55	$0.55	$0.55	$0.55	....	$0.65	$0.55
20-20.9	.65	.65	.66	.65	.66	....	.65	.65	.65	....	....	.55	.55	.55	.55	....	....	.65	.56
21-21.9	.65	.65	.68	.66	.67	....	.65	.66	.65	.65	....	....	.55	.57	.55	.55	....	.65	.57
22-22.9	.65	.66	.70	.67	.68		.66	.68	.65	.65	....	....	.56	.59	.55	.55	....	.65	.59
23-23.9	.67	.68	.72	.68	.70		.67	.70	.65	.66	....	....	.58	.60	.55	.55	....	.65	.61
24-24.9	.69	.70	.74	.69	.72		.68	.72	.65	.67	$0.65	....	.61	.62	.55	.55	$0.69	.66	.63
25-25.9	.71	.72	.76	.70	.74		.70	.74	.65	.69	.65	....	.64	.64	.57	.55	.71	.68	.65
26-26.9	.73	.74	....		.76	....	....	....	....	.71	.65	....	.66	.66	....	....	.73	.70	.67
27-27.9	.75	.76	....		.78	....	....	....	....	.73	.68	....	.68	.67	....	....	.75	.72	....
28-28.9	.77	....	....		.80	....	....	....	....	.75	.71	....	.71	.69	....	....	.77	.74	....
29-29.9	.79	....	....		....	....	....	....	....	.77	.73	....	.74	.71	....	....	.79	.76	....
30-30.9	.81	....	....		....	....	....	....	....	.79	.75	....	.76	.72	....	....	.81	.78	....
31-31.9	....	....	....		....	....	....	....	....	....	.78	....	....	....	....	....	.83	....	....
32-32.9	....	....	....		....	....	....	....	....	....	.80	....	....	....	....	....	.85	....	....
33-33.9	....	....	....		....	$0.79	....	....	....	....	.83	....	....	....	....	....	.87	....	....
34-34.9	....	....	....		....	.81	....	....	....	....	.86	....	....	....	....	....	.89	....	....
35-35.9	....	....	....		....	.84	....	....	....	....	.87	....	....	....	....	....	....	....	....
36-36.9	....	....	....		....	.87	....	....	....	....	....	....	....	....	....	....	....	....	....

*Seal Beach and Alamitos Heights prices end with $0.75 for crude 27 and above.

†Whittier and La Habra crude ends with 22-22.9 gravity.

**Posted by Union Oil Co. of California, effective June 20, 1931.

††Postings on Kettleman Hills, Ventura Avenue, Athens-Rosecrans and Dominguez discontinued by Standard. Kettleman Hills, 30 and above, posted at 66 cents by Associated Oil Co. and General Petroleum Co., June 19, 1931.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

	Oct. 26	Oct. 19
Soda Ash Light 58% bags, cwt.	$1.15-1.38	$1.15-1.38
Silicate of Soda 60 deg. drums, cwt.	$1.75-1.90	$1.75-1.90
Silicate of Soda 40 deg. tank cars, cwt.	$0.70	$0.70
Silicate of Soda 40 deg. drums, cwt.	$1.00	$1.00
Sal Soda wks.	$0.90-1.20	$0.90-1.20
Caustic Soda 76% solid, cwt.	$2.25-2.50	$2.25-2.50
Sulfuric Acid 60 deg. tank cars, f. o. b. shipping point per ton	$11.00-12.50	$11.00-12.50
Sulfur, flowers of, cwt.	$3.10-4.00	$3.10-4.00
Liquid Chlorine, tank cars, wks., lb.	1.75	1.75

Compounder's Supplies

	Oct. 26	Oct. 19
Vegetable Oils		
Linseed carloads, spot, lb.	7.40	7.30
Tanks, spot	6.80	6.70
Soya Bean, Tank, coast, lb.	5.60	5.60
Oleic Acid		
Distilled, tanks, lb.	6.50	7.00
Distilled, bbls., lb.	7.375	7.875
Saponified, tanks, lb.	6.75	7.625
Saponified, bbls., lb.	7.625	7.625
Lard Oils		
Prime Winter Strained, lb.	11.50	11.25
Extra Winter Strained, lb.	7.75	7.50
Extra, lb.	7.50	7.25
Extra No. 1, lb.	7.00	6.75
No. 1, lb.	6.75	6.50
No. 2, lb.	6.50	6.25
Tallow oil, lb.	7.00	7.00
Neatsfoot Oil		
Pure, bbls., lb.	9.25	9.25
Extra, bbls., lb.	7.00	7.00
No. 1 bbls., lb.	6.75	6.75
Cold Pressed, lb.	13.25	13.25
Fish Oils		
Menhaden Oil		
Light Pressed, gal.	33-34	33-34
Light Pressed, tank cars, N. Y., gal.	27-28	27-28
Yellow bleached, gal.	36-37	36-37
Whale, extra winter bleached, gal.	61-63	68
Naval Stores		
Steam distilled turpentine, N. Y., gal.	40	38
Steam, distilled turpentine, Savannah, gal.	37	35
Gum turpentine, N. Y., gal.	50	50
Gum turpentine, f.o.b. cars Savannah, gal.	44	44
Wood Rosin, N. Y., bbl.	$4.65	$4.65
Wood Rosin F, Savn'h, bbl.	$4.55	$4.55
Gum Rosin B, N. Y., bbl.	$3.80	$3.80
Gum Rosin B, f.o.b. cars Savannah, bbl.	$3.05	$3.05
Rosin oil, pure, gal.	47	47
Rosin, oil, compounded, gal.	41	41
Pine Tar		
Kiln burnt,	$10.00-11.00	$10.00-11.00
Retort, bbl.	$11.00-12.00	$11.00-12.00
Alcohol		
Denatured Formula 5, in tanks, per gal.	25	24

Oil Stocks and Finances

Vote to Decide Future Of Cullinan Group

NEW YORK, Oct. 24.—Stockholders of the American Republics Corp. will meet Oct. 27 in Wilmington, Del., to act on the company's future. They will be asked to empower directors to negotiate sale or exchange of the company's properties, effect a reorganization or readjustment of the capital structure, or to wind up and distribute its assets.

The company was formed in 1916 by J. S. Cullinan, one of the founders of The Texas Co., and his associates. It is a holding company with several subsidiaries operating in the oil industry. These subsidiaries include the American Petroleum Co., Federal Petroleum Co., Papoose Oil Co., Republic Production Co., Petroleum Iron Works, and Pennsylvania Tank Line.

The company has been losing money since the third quarter of 1929 and has no assurance of an early return to profitable operations, it was stated in a letter to stockholders. Through one of the subsidiaries it has held a contract to supply the Spanish oil monopoly with not less than 25 per cent of its requirements for five years from Jan. 1, 1928.

At the end of 1930 the company had leases on more than 1,750,000 acres of oil and gas lands. Production at the time amounted to 7000 barrels a day.

Its consolidated balance sheet of Dec. 31, 1930, showed total current assets of $9,787,200, including $5,302,000 cash and marketable securities, and current liabilities of $2,001,200. Total assets were $42,165,849 with property carried at $17,721,966.

Cities Service Reports Upturn in Earnings

CLEVELAND, Oct. 24.—Cities Service Co. reports an increase in earnings in September for the third consecutive month. Increases are expected to continue, the company announced, because demand for electricity and natural gas is advancing with the season. The net available for common stock and reserves in September was $715,242, compared with $3,048,310 in September, 1930, and $651,274 in August, 1931.

The company reported net of $19,260,605 for common stock and reserves in the 12 months ended Sept. 30, compared with $42,802,071 in the preceding 12 months.

The company reported it had 498,809 common stockholders, an increase of 59,934 since last Jan. 15.

Derby Oil Reports Profit

CLEVELAND, Oct. 24.—Derby Oil Co., controlled by Derby Oil & Refining Corp., reports net profit of $22,510 in the nine months ended Sept. 30. Inventory losses were written off. The net in September was $19,699. In the first nine months of 1930 the company netted $540,361.

Asphalt Earns Third Quarter Dividend

PHILADELPHIA, Oct. 24.—Earnings of General Asphalt Co. in the third quarter are reported to have been in excess of the company's dividend requirements of $206,666, or 50 cents a share on 413,333 outstanding common shares. The net in the third quarter of 1930 was $634,147, or $1.53 a share.

The first half of this year General Asphalt had a net loss of $170,660, compared with a net profit of $206,680 the first half of 1930.

Merchandising Service For Marketers

CLEVELAND, Oct. 24.—The International Petroleum Assoc. recently organized here to provide marketers with a merchandising plan, now includes jobbers and is offering this service throughout Ohio.

Members are to be identified with a "Black Diamond," as a sign of quality service. The plan has no co-operative buying, marketing of a common brand of petroleum products, or consumer rebate feature.

Jobbers are offered direct memberships on an exclusive franchise basis so there will be no conflict in territory. The jobber handles the details of identification and supervision of his own stations or those of dealers.

Fees in the association are $36 a year each, and the minimum number accepted from a jobber is 25. The $36 is divided, $15 for local advertising in county newspapers and outdoor displays, $7 for radio advertising, $5 for the emblem and standard at the station, $3 for administration expense, $1.50 for reserves, and $4.50 for selling expense.

The "Black Diamond" emblem is 17 inches high, 28 inches wide, and 48 inches off the ground.

Jobbers may withdraw from the association on 60 days written notice, with a refund of the proportional amount of their fees, if the association fails to carry out its contract. The association may cancel memberships of jobbers not keeping their station's service up to the standard.

A. B. Copeland, former Cleveland advertising man, is head of the association. J. F. Perkins is vice-president, and W. E. Frame is secretary-treasurer.

Moves Into New Bulk Plant

PHILADELPHIA—The Pennsylvania Petroleum Products Co. recently moved into its new bulk plant here, where it has storage for 100,000 gallons of motor oil. Most of the company's business is in Pennsylvania motor oils but Mid-Continent and other motor oils are also handled. The company was organized in June, 1919, by Herman M. and David I. Steinberg.

State to Keep Books On Farm Tractors

TULSA, Oct. 24.—The Oklahoma Tax Commission plans to set up a book account for each licensed tractor in the state to show how much gasoline is purchased for it. Announcement of the plan was made at a hearing at Oklahoma City Oct. 20.

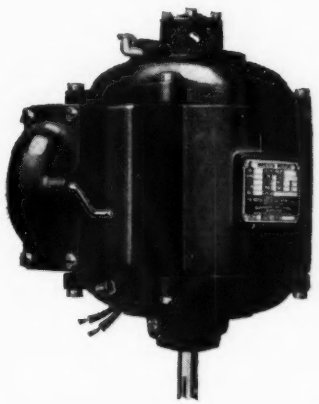
With the book account it will be possible for the state to detect when a given tractor is apparently using excessive amounts of motor fuel. Investigation can then be made to determine whether fraud is being practiced. The book account would check on a multiplicity of small purchases from various companies.

Oil companies represented at the hearing approved this plan but opposed the proposal to place the decision as to whether any given purchase was exempt up to the commission. Under present regulations the farmer may take his exemption at the time of purchase merely by making an affidavit that the fuel is to be used for agricultural purposes in the fields.

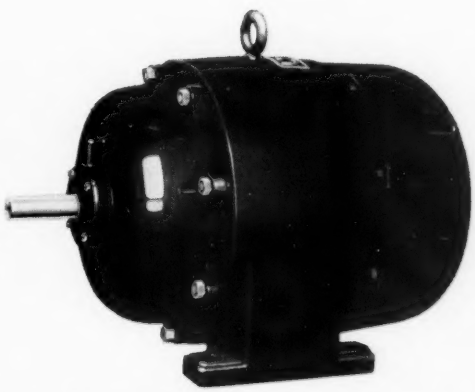
Oil company representatives approved the proposal to permit farmers to sign affidavits within ten days of date of purchase. This would allow farmers to send employes for gasoline whereas now they must buy in person and sign the affidavit at time of purchase.

Are you getting all these advantages *in your* MOTORS?

Check some of the reasons why MASTER Explosion Resisting MOTORS are BETTER



Master Explosion Resisting Motors for gasoline curb pump operation, ¼ and 1/3 H.P., with or without switch. Above is the Master Motor and Switch Unit, a development pioneered by Master Engineers, presenting several distinct advantages: Greater safety; neat, compact assembly; lower assembly cost.



Master Explosion Resisting Motors for use in hazardous vapors are built in a range of sizes from ¼ to 10 H.P.

1 — The through bolts that hold the end covers do not pass through the inner housing—no end bolt seals required—the motor can be opened up for cleaning or repair without destroying its explosion resisting qualities.

2 — The motor leads come out through the motor frame instead of the end cover, permitting a permanent lead seal.

3 — All sizes can be supplied with an Underwriters' Approved Explosion Resisting Switch.

4 — Sizes ½ to 10 H.P. are air jacketed, fan cooled—not just plain enclosed motors.

5 — The Master design is easily adapted to mechanical "Specials" such as double extended shaft, gear reduction head, etc.

6 — Sizes 2 to 10 H.P. inclusive are equipped with ball bearings.

7 — Master Explosion Resisting Motors are available for either Vertical or Horizontal mounting.

8 — In the Vertical type they can be supplied for plain, flange or leg mounting.

9 — They have interchangeable mounting dimensions for AC (single or polyphase) or DC.

10 — They have these performance characteristics:— High, uniform starting torque; high overload capacity; low temperature rise; quietness of operation.

11 — All Master Explosion Resisting Motors carry Underwriters' label.

12 — Prompt service is available when necessary; more than 100 Service Stations are conveniently located to serve your needs.

THE MASTER ELECTRIC COMPANY
Dayton, Ohio

MASTER
GUARANTEED
MOTORS
POWER DIAMONDS

Transactions in Oil Shares on New York Stock Exchange

1930 High	1930 Low	1931 High	1931 Low	Listed Shares	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended Oct. 24 Sales Shares	High	Low	Last	Week's Change
31 1/4	16 1/2	23	13	922,075	N.P.	Amerada Corp.	50cQ	Oct. 30, 31	700	15	14 1/2	14 1/2	0
37	5 1/8	12 3/8	2 1/4	209,180	N.P.	American Republics Corp.	....	.....	2,100	3 1/8	2 5/8	2 3/4	— 1/8
51	30	31	9	2,240,000	$25	Associated Oil Co.	....	June 30, 31	.....	....	....	....	....
51 3/8	16 5/8	23 3/8	10	2,691,764	25	Atlantic Refining Co.	25cQ	Sept. 15, 31	12,700	13	12	13	+ 7/8
34	8 5/8	14 1/2	4 3/4	2,257,678	25	Barnsdall Corp. A	....	May 11, 31	18,500	6 1/2	5 7/8	6 1/4	+ 1/4
35	21	25	12	2,060,966	25	California Petroleum Corp.	....	Jan. 1, 29	.....	....	....	....	....
20 5/8	8 3/4	10 1/4	7 1/8	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	300	10 1/8	9 1/2	10 1/8	+ 5/8
30 1/2	7 3/4	12	5	4,712,745	N.P.	Continental Oil Co. (Del.)	....	.....	21,200	7 3/8	6 1/2	7 1/4	+ 1/2
71 1/8	22 3/8	47	9 5/8	413,333	N.P.	General Asphalt Co.	50cQ	Sept. 15, 31	21,800	16 3/4	13 1/8	16 1/2	+ 2 1/8
116 7/8	29 1/4	68 1/2	19	97,071	$100	Houston Oil Co.	....	.....	18,600	31 5/8	27	31	+ 4
11 3/4	6 5/8	14 1/8	4	673,414	25	do new	....	.....	7,400	6 3/8	5 3/8	6 1/4	+ 5/8
28 3/8	3	4 5/8	1 5/8	556,356	10	Indian Refining Co.	....	Dec. 15, 20	1,000	2 3/8	2 3/8	2 3/8	— 1/8
12	3 1/2	4 1/2	1 5/8	1,309,003	N.P.	Louisiana Oil Refg. Corp.	....	.....	200	1 3/8	1 3/8	1 3/8	— 1/8
90	66	55	34	40,000	$100	do pfd.	$1.62 1/2Q	Aug. 15, 31	.....	....	....	....	....
10 3/8	1 3/4	3 3/4	1/2	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	1,800	7/8	3/4	7/8	0
182	150	171	90	459,428	$100	Mexican Petroleum Co.	....	Apr. 20, 31	.....	.....	....	....	....
100	100	100	100	120,000	100	do pfd.	$2Q	Oct. 20, 31	.....	....	....	....	....
33	11	16 3/4	5	1,857,912	N.P.	Mid-Continent Petroleum Corp.	....	Feb. 16, 31	6,100	7 1/8	6 1/8	7	+ 5/8
32	16	19 1/2	6 1/2	6,648,052	N.P.	Ohio Oil Co.	....	Mar. 14, 31	22,500	8 1/2	7 1/2	8 1/4	+ 1/4
64 1/4	42	35 5/8	20	1,000,000	$50	Pan Amer. Pet. & Trans. Co.	40cQ	Oct. 20, 31	.....	....	....	....	....
67 1/2	30	36 1/2	20	2,473,577	50	do B non-voting	40cQ	Oct. 20, 31	100	22	22	22	0
12 3/4	1 3/4	4 1/4	3/4	199,370	N.P.	Panhandle Prod. & Refg. Co.	....	.....	200	1	1	1	0
80	47 1/2	20	9 1/2	25,666	$100	do pfd.	....	July 2, 23	120	9 1/2	9 1/2	9 1/2	0
27 1/4	5 7/8	10 1/8	4 1/4	3,726,084	N.P.	Petroleum Corp. of America	....	June 1, 31	13,200	5 5/8	5	5 1/2	+ 1/2
44 3/4	11 1/2	16 5/8	4 3/4	4,416,251	N.P.	Phillips Petroleum Co.	....	Jan. 2, 31	14,000	6 3/4	6	6 1/2	+ 1/2
2 1/2	1/2	1 1/2	1/2	1,184,917	$25	Pierce Oil Corp.	....	.....	800	1/2	1/2	1/2	0
52	7 1/2	23 3/4	5 1/8	150,000	100	do pfd.	....	Feb. 1, 22	1,200	7 3/4	7	7 3/4	+ 3/4
7 1/8	1 5/8	3 3/8	7/8	2,500,000	N.P.	Pierce Petroleum Corp.	....	Feb. 16, 31	3,500	1 3/8	1	1 1/8	— 1/8
54	11 1/4	20 3/8	5 1/2	2,441,432	$25	Prairie Oil & Gas Co.	....	Mar. 31, 31	2,700	7 3/8	6 7/8	7 1/2	+ 3/8
60	16 5/8	26 1/2	7 5/8	4,050,000	25	Prairie Pipe Line Co.	....	July 1, 31	3,650	9 1/8	8 5/8	9 1/4	+ 3/8
11 7/8	1	6	1 1/2	749,017	50	Producers & Refiners Corp.	....	Sept. 15, 23	1,100	1 7/8	1 1/2	1 7/8	+ 3/8
40	11 1/2	16	4 1/4	56,907	50	do pfd.	....	May 4, 25	110	4 7/8	†4 1/4	4 1/4	— 1 1/2
27 1/4	7 5/8	11 7/8	5	3,038,370	25	Pure Oil Co.	....	Sept. 1, 30	4,900	6 1/8	5 5/8	6	+ 1/4
114 1/4	90 1/2	101 7/8	64 1/2	130,000	100	do 8% pfd.	$2Q	Oct. 1, 31	70	72	70 3/8	72	+ 2
28 1/4	4 1/8	6 3/8	7/8	2,126,250	N.P.	Richfield Oil Co. (California)	....	Sept. 1, 30	900	1	7/8	7/8	— 1/4
25 3/4	5	10 1/4	2 1/8	1,235,542	N.P.	Rio Grande Oil Co.	....	July 25, 30	12,300	4 1/4	3 3/8	4 1/8	+ 1 1/4
56 1/2	36 7/8	42 5/8	13 1/2	681,728	$13.40	Royal Dutch Co. (N. Y. Shares)	93.85c	Aug. 4, 31	5,600	20 5/8	19 1/2	20 1/4	+ 1
37	9 3/4	20 3/4	5 1/2	1,244,383	N.P.	Seaboard Oil of Del.	....	Oct. 15, 24	22,900	9 1/4	7 3/4	9	+ 1
48 3/8	26	34	9 3/4	68,810	£2	Shell Transp. & Trading Co.	72.6c	July 23, 31	318	14	12	14	+ 4
25 1/2	5 1/4	10 1/4	3 1/4	13,070,625	N.P.	Shell Union Oil Corp.	....	June 30, 30	7,100	4 1/2	4	4 1/2	+ 1/8
106 1/4	55	78	23 5/8	400,000	$100	do pfd.	....	July 1, 31	2,800	31 1/4	28	30 1/2	+ 3 1/2
37	5 5/8	11	4 3/4	869,271	10	Simms Petroleum Co.	....	Sept. 15, 30	3,300	6 1/4	5 1/4	5 7/8	+ 7/8
32	9 3/4	15 7/8	5 1/2	6,148,294	N.P.	Sinclair Cons. Oil Corp.	....	Apr. 15, 31	38,800	7 1/4	6 1/2	7 1/8	+ 1/8
112 1/4	86	103	77	141,294	$100	do pfd.	$2Q	Aug. 15, 31	200	87 1/2	86 1/2	87 1/2	+ 6 3/8
42	10 1/8	12 7/8	3 1/8	1,000,069	25	Skelly Oil Co.	....	Dec. 15, 30	1,700	4 3/4	4	4 1/8	0
99 3/4	42	62	10	120,000	100	do pfd.	....	May 1, 31	900	15 3/4	14	15 3/4	+ 2 1/2
....	....	21	12 1/8	31,923,072	25	Socony Vacuum Corp.	40cQ	Sept. 15, 31	37,600	14 7/8	13 3/4	14 7/8	+ 7/8
106 3/8	98	105 1/4	88 1/2	764,836	100	S. O. Export Corp. pfd.	$2.50S.A.	June 30, 31	600	95	93 1/2	93 1/2	— 1 5/8
75	42 1/4	51 3/4	28 5/8	13,102,900	N.P.	S. O. California	62 1/2cQ	Sept. 15, 31	28,700	34 1/2	31 1/4	34 1/2	+ 3 1/8
49	14 3/8	19	8 1/4	320,000	$25	S. O. Kansas	....	Mar. 16, 31	2,200	10	9 1/2	10	0
84 7/8	43 1/2	52 1/2	28 1/4	25,548,466	25	S. O. New Jersey	††25cQ	Sept. 15, 31	58,000	34 3/8	31 5/8	34 1/8	+ 2 1/8
70	39	45 1/4	26 3/4	1,544,275	N.P.	Sun Oil Co.	25cQ	Sept. 15, 31	200	32 1/2	31 1/8	31 1/8	0
108 1/2	97 3/4	104 1/2	89	100,000	$100	do pfd.	$1.50Q	Sept. 1, 31	160	90	90	90	+ 1
9 3/8	3/4	1 3/4	1/2	776,979	N.P.	Superior Oil Corp.	....	.....	300	3/4	5/8	5/8	+ 1/8
60 1/2	28 1/4	36 1/4	15	9,851,163	$25	The Texas Corp.	50cQ	Oct. 1, 31	22,800	19 1/2	18 3/8	19	+ 3/4
14 1/2	4	6 1/2	2 1/2	930,404	10	Texas Pacific Coal & Oil Co.	....	Dec. 31, 29	2,700	3 1/2	3	3	— 5/8
17 3/4	5 7/8	9	3 1/2	5,996,965	N.P.	Tide Water Associated Oil Co.	....	Feb. 16, 31	4,800	4 1/8	3 5/8	4	+ 1/4
89 3/4	53	68	20 1/2	732,644	$100	do pfd.	$1.50Q	Oct. 1, 31	1,000	27	26	26 1/2	0
31	12	18	10 1/2	2,191,820	N.P.	Tide Water Oil Co.	....	June 30, 31	.....	....	....	....	....
94 7/8	68	83	35	199,446	$100	do pfd.	$1.25Q	Aug. 15, 31	400	40	38	40	+ 5 3/4
50	20 1/8	26 5/8	11 3/4	2,325,006	25	Union Oil Co. of California	50cQ	Aug. 10, 31	10,700	16 7/8	15	16 3/4	+ 1
38 1/2	23	25 1/8	18 1/2	1,254,048	N.P.	Union Tank Car Co.	40cQ	Sept. 1, 31	1,300	19	18 1/2	18 1/2	— 1/2
27	4 1/4	7 3/8	1	769,531	N.P.	Warner Quinlan Co.	....	July 3, 30	300	1 1/2	1 1/2	1 1/2	0
21	6 1/2	9 3/8	3	428,967	N.P.	H. F. Wilcox Oil & Gas Co.	....	May 10, 28	700	3 5/8	3 1/2	3 1/2	0

*New high †New low ††Also extra—S. O. New Jersey 25c. Total sales 449,828.

Pittsburgh Stock Exchange

Transactions Week Ended Oct. 23, 1931

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas....	50	3	3	3	+ 1/2
do pfd.....	500	5	5	5	0
Col. Gas & Elec...	50	22	22	22	+1 1/2
Lone Star Gas....	9,020	10	9 1/2	9 3/4	0
Phoenix Oil.....	1,000	.10	.10	.10	0
Plymouth Oil....	150	7 3/4	7 1/2	7 1/2	— 1/8
Shamrock Oil & Gas.....	6,710	1 1/2	1 1/4	1 1/2	— 1/2
West. Pub. Serv..	917	5 1/2	5	5 1/2	0

New York Curb Bonds

Week Ending Oct. 23

	High	Low	Last	Change
Cities Serv. 5s '50.....	53 5/8	50 3/8	53 3/8	+2 1/4
Cities Serv. G. 5 1/2s '42..	52	50 3/4	51	— 1/8
Cities Serv. 6s '43.....	62	61 1/4	61 3/4	+1
Cont. Oil 5 1/2s '37.....	83 1/2	82 1/2	82 1/2	0
Empire O. & R. 5 1/2s '42.	46	34 1/4	46	+1 1/2
Gulf Oil 5s '37.....	98 1/2	98	98	— 1/2
Gulf Oil 5s '47.....	97 1/4	96	95 5/8	— 1/8
Indep. Oil 6s '39.....	81	77	77	+1
Sun Oil 5 1/2s '39.....	92	89 1/2	91 1/4	—3 5/8

Cleveland Stock Market

October 23, 1931

	Bid	Asked	Last Sale
Canfield Oil.....	50	75 3/4	85
Fred G. Clark.....	3/4	1 1/8	1 1/8
National Refining.....	5	10	10
do pfd.....	..	110	119

Indian to Reduce Capital

NEW YORK, Oct. 24.—Indian Refining Co., controlled by The Texas Corp., is reducing its capital stock from $2,000,000 shares of $10 par each to 1,250,000 shares.

To Hear Gas Tax Appeal

WASHINGTON, Oct. 26.—The U. S. Supreme court today admitted the appeal of the Yale Oil Corp. vs. the state of Montana on the question of whether the 3-cent gasoline tax effective Jan. 1, 1927, was retroactive to the extent that it covered gasoline on hand on that date on which the 2-cent tax had been paid in 1926.

Aviation Gasoline Prices

(*Continued from Page 149*)

S. O. LOUISIANA

	T.W.	Tax	Total T.W.
New Orleans, La.	18	6	24
Nashville, Tenn.	20	6	26
Memphis, Tenn.	19	6	25

2c per gal. discount off above posted retail t.w. prices to dealers and commercial consumers.

S. O. NEBRASKA

Omaha	16.25	4	20.25

2c per gal. refund to reseller.

CONTINENTAL OIL CO.

Denver, Colo.	13	4	17
Cheyenne, Wyo.	14	4	18
Helena, Mont.	18	5	23
Salt Lake City, Utah	16.5	4	20.5
Albuquerque, N. M.	16	5	21
Boise, Ida.	18.5	5	23.5

S. O. CALIFORNIA

Phoenix, Ariz.	17.5	4	21.5
Los Angeles, Cal.	16.5	3	19.5
San Francisco, Cal.	17	3	20
Reno, Nev.	21	4	25
Portland, Ore.	17.5	4	21.5
Seattle, Wash.	17.5	3	20.5
Spokane, Wash.	21.5	3	24.5

Note: 4c per gallon added to t.w. price, in S. O. California territory, to customers taking delivery direct into the fuel tank of planes.

Oil Trademarks For Copyright

THE following trademarks are in line for early registration at the U. S. Patent Office.

For further information on trademark matters, address either the Editor of this Department, or this publication's trade-mark specialists, the National Trade-Mark Co., Barrister Bldg., Washington, D. C.

A free advance search as to registrability of any trademark or tradename a reader may contemplate adopting is offered by NATIONAL PETROLEUM NEWS.

"DOWLENE." Ser. No. 270,311. The Dow Chemical Co., Midland, Mich. For cleaning compositions and compounds—namely oil, fat, grease removers; tar, gum and organic resin removers; and solvent type cleaning fluid.

"NAMCO." Ser. No. 317,673. The National Acme Co., Cleveland, Ohio. For non-measuring gasoline pumps.

"CHEXALL." Ser. No. 316,007. Albert W. Heinemann, Independence, Kansas. For oiling chart check and indicator for personal use by employees in automobile servicing.

"KOTO." Ser. No. 317,785. Stanco Inc., New York City. For lubricating oils.

"PENNCROSS." Ser. No. 317,974. Henry H. Cross Company, Chicago, Ill. For lubricating oils.

"WOLF'S HEAD." Ser. No. 310,315. Wolverine-Empire Refining Company, Wilmington, Del., and New York City. For lubricating oils and greases.

Representation of a wolf's head. Ser. No. 310,316. Wolverine-Empire Refining Company, Wilmington, Del., and New York City. For lubricating oils and greases.

"RED-TOP." Ser. No. 308,080. William H. McKenzie, doing business as Red Top Oil Burner Co., Chicago, Ill. For oil burners.

"TRACT-A-ROLLER." Ser. No. 316,902. Sinclair Refining Co., New York City. For lubricating oils and greases.

"COMBAT." Ser. No. 317,572. Richfield Oil Company, Los Angeles, Calif. For petroleum and petroleum products—namely, gasoline, kerosine, motor fuel oil, furnace fuel oil, road dressing oil; lubricating oils and lubricating grease.

"CHALLENGE," and outline of a shield. Ser. No. 313,576. Wright, Stephenson & Co. Ltd., Wellington, New Zealand. For benzine, gasoline, kerosine, lubricating oils and lubricating greases.

"GLOBE." Ser. No. 312,185. Globe Oil Tools Co., Los Nietos, Calif. For well drilling equipment.

"GLOBE," and representation of the globe. Ser. No. 312,184. Globe Oil Tools Co., Los Nietos, Calif. For well drilling equipment.

"VACOMY." Ser. No. 311,987. Vacuum Oil Company, New York City. For oils, greases and waxes of all kinds, and similar products, all for lubricating, illuminating, heating and fuel purposes also gasoline, naphtha, benzine, and kerosine.

"SOLO," and picture of an airplane. Ser. No. 317,099. Solo Oil Company, McAlester, Okla. For motor lubricating oil and automotive packing grease.

"UNI PASS," and representation of an arrow. Ser. No. 318,347. S. F. Bowser & Co. Inc., Fort Wayne, Ind. For oil purifying and reclaiming apparatus for reclaiming, purifying and filtering oils used in connection with electrical apparatus, etc.

"SHELL." Ser. No. 318,601. Shell Oil Co., San Francisco, Calif. For petroleum coke. Representation of a shell. Ser. No. 317,602. Shell Oil Co., San Francisco, Calif. For petroleum coke.

THE OIL INDUSTRY EXCHANGE

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SALES EXECUTIVE—Thoroughly experienced marketer both wholesale and retail. Entirely conversant operation bulk and retail outlets. College education. Age 34. Address Box 779.

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NINE YEARS INTENSELY PRACTICAL EXPERIENCE, oil absorption, compression and charcoal plants, loading racks to superintendent. Exceptional reference. Address Box 800.

REFINERY SUPERINTENDENT — Fourteen years of both technical and practical experience on all types of skimming and cracking stills. Available after November 1st. Address Superintendent, care National Petroleum News, 904 World Bldg., Tulsa, Okla.

Miscellaneous

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THE following letter came to us last week entirely unsolicited. It begins, "I wish to tell you of the gratifying results obtained from my advertisement in your publication. I was able to get exactly what I desired, as the replies I received were so numerous. I feel it is the best $3 I ever invested." Give yourself a chance to duplicate this oil man's experience. Send in your advertisement now. The rates and other information are below.

Advertisers having box numbers should be addressed in care of National Petroleum News, 1213 West 3rd Street, Cleveland, Ohio, unless otherwise specified.

Fruehauf Moves Chicago Office

CHICAGO—Fruehauf Trailer Co., Detroit, has moved its Chicago branch from South Wabash Ave. to Michigan Ave. at 29th St. C. L. Schneider, who has been with the company 14 years, in both the engineering and sales work, has been appointed manager at Chicago.

Another appointment announced by G. W. Chamberlin, vice president and director of sales is Frank L. Tully who has been made manager at Cleveland. He succeeds Harry S. Moore who has been promoted to special sales work.

The DeVilbiss Co., Toledo, O., manufacturer of spray-painting and spray-finishing equipment, has off the press a catalog describing its portable spray-painting outfits and designed to interest every user of spray-painting and decorating equipment. It is complete and concise and gives also prices of various devices.

Standard Oil Stocks on New York Curb Market

1930 High	1930 Low	1931 High	1931 Low	Shares Issued	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended Oct. 24 Sales Shares	High	Low	Last	Week's Change
25	11¼	16	6¼	40,000	$25	Borne Scrymser Co.	....	Oct. 15, 30	200	7¾	7¾	7¾	+ ¼
69	39⅞	56	39	200,000	50	Buckeye Pipe Line Co.	$1Q	June 15, 31	100	41	41	41	+ 2
184⅞	100¼	129½	95	120,000	25	Chesebrough Mfg. Co.	††$1Q	June 30, 31	200	90	90	90	+ 2
7⅝	3	3½	1¾	5,977,873	N.P.	Creole Petroleum Co.	....	.....	1,000	1⅞	†1¾	1¾	— ⅛
65¾	20¼	39	20⅝	30,000	50	Cumberland Pipe Line Co.	50cQ	June 15, 31	.....	....	....	....	....
54¾	26	36	19	50,000	100	Eureka Pipe Line Co.	$1Q	July 1, 31	150	22	22	22	+ 2
6¾	2½	3	1	280,000	N.P.	Galena Oil Corp.	....	.....	.....	....	....	....	....
119	57¼	72	47¾	2,974,645	$25	Humble Oil & Ref'g. Co.	50cQ	July 1, 31	200	53	50¼	52	+ 4¼
30	15	18½	7⅜	26,557,496	N.P.	Imperial Oil Corp.	12½cQ	Sept. 1, 31	16,500	10¼	9¾	10¼	+ 1¼
28	15	18	7⅛	.....	N.P.	do registered	12½cQ	Sept. 1, 31	1,200	10	9¾	10	0
41	14½	21⅛	5½	300,000	$10	Indiana Pipe Line Co.	25cQ	Aug. 15, 31	12,100	8¼	8	8	0
24	11⅜	15½	7⅜	14,247,088	N.P.	International Petroleum Co.	25cQ	June 15, 31	17,400	10⅝	9¼	10⅝	+ 1½
22⅜	11½	17½	8⅛	509,000	$12.50	National Transit Co.	25cQ	June 15, 31	100	10	10	10	0
21	10⅛	14½	5⅞	100,000	10	New York Transit Co.	††15cQ	July 15, 31	1,400	8¾	8	8⅞	+ 1⅜
54	26¼	34¼	20	40,000	50	Northern Pipe Line Co.	††$1.50S.A.	July 1, 31	.....	....	....	....	....
108	100⅜	102⅞	80	579,465	100	Ohio Oil Co. pfd.	$1.50Q	June 15, 31	.....	....	....	....	....
32	12	15½	6	400,000	25	Penn Mex. Fuel Co.	75c	June 24, 31	.....	....	....	....	....
33	4⅞	16⅞	3¼	160,000	25	Solar Refining Co.	....	Dec. 20, 29	700	16⅞	16⅞	16⅞	0
20⅛	6¾	17	9	100,000	10	Southern Pipe Line Co.	50cQ	Sept. 1, 31	.....	....	....	....	....
45⅞	18	23⅞	12	1,200,000	25	South Penn Oil Co.	25cQ	June 30, 31	1,000	14½	14	14	0
64	32	42½	25	35,000	50	Southwest Pa. Pipe Lines.	$1Q	July 1, 31	.....	....	....	....	....
59⅞	30	38½	15⅞	16,850,587	25	S. O. Indiana	50cQ	June 15, 31	14,100	21½	20	21⅜	+ 1⅜
40½	18⅞	23⅜	13¼	2,588,735	25	S. O. Kentucky	40cQ	June 30, 31	6,100	16½	15¼	15⅞	+ ⅛
48⅞	34	36½	16½	190,822	25	S. O. Nebraska	50cQ	June 20, 31	100	21½	21½	21½	+ 1½
108½	43¼	62½	35	766,667	25	S. O. Ohio	62½cQ	July 1, 31	350	41	40⅞	40⅞	— ⅝
....	....	115¼	98½	120,000	100	do 5½ pfd.	$1.25Q	July 15, 31	.....	....	....	....	....
10	4	10	2⅝	34,158	25	Swan Finch Oil Corp.	....	Jan. 15, 29	.....	....	....	....	....

*New high †New low ††Also extra—Chesebrough 50c; N. Y. Transit 10c; Northern P. L. 50c.

Oil and Royalty Stocks on New York Curb

1930 High	1930 Low	1931 High	1931 Low	Par Value		Transactions Week Ended Oct. 24 Sales Shares	High	Low	Last	Week's Change
4½	½	1¾	¼	N.P.	American Maracaibo	700	½	⅜	½	+ ⅛
16⅞	4⅝	6½	2⅛	N.P.	Arkansas Nat. Gas	300	3	2¾	2¾	— ¼
16⅝	4⅝	6¾	2	N.P.	do A	6,300	3	2⅝	2⅞	0
8⅛	6¼	7	3⅞	$10	do pfd.	1,100	5	5	5	+ ½
1	¼	1	⅛	N.P.	Atlantic Lobos	.....	....	....	....	....
1½	⅛	3¼	¼	$50	do pfd.	.....	....	....	....	....
21	13⅜	16⅞	6¼	N.P.	British American coup.	200	8¾	8¾	8¾	+ ⅝
....	....	16¾	10	N.P.	do registered	400	15¾	15½	15¾	+ ¾
2¾	⅜	2⅜	½	$¼	Carib Syndicate	500	⅝	½	⅝	+ ⅛
44¼	13⅛	20¾	5¼	N.P.	Cities Service	68,900	8	7⅞	7⅞	+ ¼
93⅞	78¼	84¾	35⅝	$100	do pfd.	500	54⅜	53¼	54⅜	+ 1⅜
9	7¼	7½	4⅞	10	do pref. B	.....	....	....	....	....
89⅞	80	84	43	100	do pref. BB	.....	....	....	....	....
8¼	1⅛	3⅛	¾	N.P.	Colon Oil Corp.	400	1	⅞	⅞	0
21	3⅜	7⅛	1	N.P.	Col. Oil & Gas. vtc.	6,400	2⅛	1⅞	2⅛	+ ¼
5⅞	2	2¾	1¼	$1	Consolidated Royalty	100	1½	1½	1½	+ 1/16
74¾	1¼	3¾	½	N.P.	Cosden Oil	700	1⅛	†½	1	0
70	10¼	15	1	$100	do pfd.	.....	....	....	....	....
1	¼	....	⅛	N.P.	Crown Central Petrol.	.....	....	....	....	....
21¾	2½	5	2	N.P.	Darby Petroleum	500	2	2	2	— ½
11	2	6	1¾	N.P.	Derby Oil & Refining	200	2⅛	2⅛	2⅛	— ⅜
60	30	40⅛	25	N.P.	do pfd.	.....	....	....	....	....
106⅞	58½	76	38	$25	Gulf Oil Corp.	11,200	49¼	44⅛	48½	+ 2¾
40¾	36	9¾	9¾	....	Honolulu Oil Corp.	.....	....	....	....	....
47½	12⅝	16⅞	5½	N.P.	Indian Ter. Ill'g. Oil A	300	6⅜	5¾	6⅜	+ ⅞
53½	12⅝	16⅞	6⅛	N.P.	do B	.....	....	....	....	....
1¾	⅜	⅝	1/16	$5	Intercontinental Petrol.	3,700	1/16	1/16	1/16	— 1/16
3	⅞	1⅞	½	N.P.	Kirby Petroleum	.....	....	....	....	....
4¾	½	1½	1/16	$25	Leonard Oil Devel.	3,600	1/16	⅜	⅜	0
29	4⅞	6¾	2¾	N.P.	Lion Oil Refining	.....	....	....	....	....
55⅞	19⅝	29	7¼	N.P.	Lone Star Gas	4,100	10	9¼	9½	— ¼
31	5½	....	....	$25	MacMillan Petroleum	.....	....	....	....	....
½	⅛	½	⅛	$1	Magdalena Syndicate	5,800	¼	1/16	¼	0
16	3	5	2⅝	N.P.	Margay Oil Co.	.....	....	....	....	....
7½	1¾	4⅞	1½	N.P.	Mexico-Ohio Oil	.....	....	....	....	....
....	....	8⅞	2	N.P.	Michigan Gas & Oil	.....	....	....	....	....
11⅞	2¼	4⅝	⅞	N.P.	Mid. States Pet. A vtc.	700	1⅝	1½	1½	+ ⅛
6	⅝	1½	½	N.P.	do B vtc.	100	⅝	⅝	⅝	0
36½	5	11	2	$5	Missouri-Kansas P. L.	4,200	2⅝	2¼	2½	0
6	⅜	⅝	⅜	1	do B vtc.	400	⅜	⅜	⅜	0
¾	⅜	⅞	⅜	1	Mountain & Gulf	.....	....	....	....	....
12½	3⅜	5⅞	2½	10	Mountain Producers	400	3⅝	3⅛	3⅛	0
41⅜	19⅞	26½	11½	N.P.	National Fuel Gas	1,900	15¼	14⅞	15	— ⅛
3½	1⅛	1½	½	$5	New Bradford Oil	300	½	½	½	0
3⅜	2⅜	2⅛	1½	10	New England Fuel	.....	....	....	....	....
16⅞	4	....	....	25	N. Y. Pet. Royalty	.....	....	....	....	....
....	....	6½	6½	10	N. American Oil	.....	....	....	....	....
11¼	2⅛	3¼	1	N.P.	North Central Texas	200	2½	1½	2½	0
4⅛	⅝	2½	⅜	N.P.	North European Oil	200	1/16	1/16	1/16	+ 1/16
11⅝	3⅛	5	1	N.P.	Oilstocks Ltd. A	.....	....	....	....	....
11½	4½	5	2½	N.P.	do B	.....	....	....	....	....
19½	5½	15	3	N.P.	Pacific Western Oil	500	4⅛	3⅞	4	+ ¼
2½	¼	....	⅛	N.P.	Pandem Oil	4,200	1/16	⅛	1/16	0
4⅜	1	2	⅜	N.P.	Pantepec of Venezuela	.....	....	....	....	....
5⅞	½	1⅛	¼	....	Petroleum Corp. war.	1,800	⅜	¼	¼	— ⅛
27½	16¼	19	6	$5	Plymouth Oil	2,500	8⅜	7¾	8⅜	+ 1⅛
8	3⅛	4½	1/16	N.P.	Producers Royalty	300	½	½	½	0
99	81¾	83½	15¾	$100	Pure Oil 6% pfd.	.....	....	....	....	....
10½	1½	2½	1	N.P.	Red Bank Oil	.....	....	....	....	....
5⅜	⅝	2¼	½	N.P.	Reiter-Foster Oil	1,900	1⅛	1	1	— ⅛
23½	6½	11	1	$25	Richfield Oil pfd.	200	1⅛	1⅛	1⅛	+ ⅛
25	2¼	5	1¾	N.P.	Root Refining pfd.	.....	....	....	....	....
12⅜	5½	3¾	1	$10	Roy. Corp. of Amer. pfd	.....	....	....	....	....
8⅝	2	2⅞	1	N.P.	Ryan Consolidated	.....	....	....	....	....
2½	½	1⅜	¼	$10	Salt Creek Consol.	.....	....	....	....	....
15¼	5¼	7⅝	3¾	10	Salt Creek Producers	200	4¼	4	4	0
8	1¾	5¼	2	25	Shreve. El Dorado P.L.	.....	....	....	....	....
17	6	7½	3⅝	N.P.	Southland Royalty	100	3¾	3¾	3¾	— ¼
10	2	5¼	½	$5	Sunray Oil	3,600	⅞	1/16	¾	+ ¼
19½	8	12⅞	2½	N.P.	Texon Oil & Land	600	5⅞	5¼	5⅞	+ ½
47½	19	24½	11¼	$25	Union Oil Associates	100	15	15	15	+ 3¾
4½	⅝	1⅞	⅜	5	Venezuela Petroleum	700	⅝	½	½	+ ⅛
5	2	3½	1⅜	1	Woodley Petroleum	.....	....	....	....	....
2½	⅜	2¼	¼	N.P.	Y Oil & Gas	600	½	½	½	0

*New high †New low

Oil Dividends

Declared Last Week

Company and Period	Amount	Stock of Record Payable
Canadian Oil q.	25c	Nov. 14 Oct. 31
Cities Service m.	2½c	Dec. 1 Nov. 14
do stock m.	½%	Dec. 1 Nov. 14
do pfd. m.	50c	Dec. 1 Nov. 14
do pref. B m.	5c	Dec. 1 Nov. 14
do pref. BB	50c	Dec. 1 Nov. 14
Oil Shares pfd.	25c	Oct. 29 Oct. 19
Penn Mex Fuel	50c	Oct. 31 Oct. 24

Awaiting Payment

Company and Period	Amount	Stock of Record Payable
Amerada Corp. q.	50c	Oct. 30 Oct. 15
Cities Service m.	2½c	Nov. 2 Oct. 15
do stock m.	½%	Nov. 2 Oct. 15
do pfd. m.	50c	Nov. 2 Oct. 15
do pref. B m.	5c	Nov. 2 Oct. 15
do pref. BB m.	50c	Nov. 2 Oct. 15
Eureka Pipe Line q.	$1	Nov. 2 Oct. 15
Indiana Pipe Line q.	25c	Nov. 14 Oct. 23
Lone Star Gas pfd. q.	$1.62	Nov. 2 Oct. 24
National Refining q.	12½c	Nov. 15 Nov. 1
Salt Creek Prod. q.	25c	Nov. 2 Oct. 12
Sinclair Cons. pref. q.	$2	Nov. 14 Nov. 5
Tide Water Oil pfd. q.	$1.25	Nov. 16 Oct. 17
Union Oil Calif. q.	50c	Nov. 10 Oct. 17

Paid Last Week

Company and Period	Amount	Date Paid
Mexican Pet. pfd q.	$2	Oct. 20
Pan Amer. Pet. com. q.	40c	Oct. 20
do B q.	40c	Oct. 20

New York Bonds

Week Ending Oct. 23

	High	Low	Last	Change
Asso. Oil Gold 6s	101½	101	101¼	+ ¼
Atlantic Refg. deb. 5s	97	95	96	+ ½
Cal. Pet. 5s	79	79	79	—1
Cal. Pet. 5½s	89	89	89	—1
General Pet. 5s	101⅜	100	101⅜	+ ½
Humble Oil & Refg. 5s	100½	100	100	0
Humble Oil & Refg. 5½s	100¼	100	100⅛	— ⅛
Pan Amer. P & T 6s	101⅜	101⅝	101⅜	— ⅛
Pan Amer. P & T 6s	13½	13½	13½	+ ¼
Phillips Pet. 5½s	57	53½	57	+2¾
Pure Oil 5½s	77	75½	77	+ ⅛
Pure Oil 5½s	75	72	74	0
Richfield Oil of Calif. 6s	13¼	12½	13	+ ½
Shell Union Oil 5s	65½	62⅛	62½	—2
Shell Union Oil 5s with war.	64½	62½	63⅜	— ⅜
Sinclair Con. Oil 7s	82⅜	81	82	+1
Sinclair Con. Oil 6½s	77½	75	77½	+2
Sinclair Con. Crude 5½s	97¾	96¾	97¼	+ ¼
Sinclair Pipeline	96¾	95	96¾	+1¾
Skelly Oil 5½s	59	56¼	56⅝	—1⅜
S. O. N. J. 5s	102	101	101½	0
S. O. N. Y. 4½s	92¾	91	92¾	+ ¾
Union Oil of Calif. 6s A	100¼	100¼	100¼	— ¼
Union Oil of Calif. 5s C	95	94¼	94¼	— ¾
Warner-Quinlan 6s	34½	32	32	—3
White Eagle Oil 5½s war.	102	101⅝	102	0

Derby Seeks Right to Sell Red Gasoline in Colo.

TULSA, Oct. 24.—The extent to which a state can go in regulating the coloring of gasoline is one of the questions which the Derby Oil & Refining Corp. seeks to determine in a suit it has filed in the district court of the City and County of Denver. The suit is directed against James Duce, state oil inspector, the attorney general of the state and the district attorneys of 14 judicial districts.

The Derby company has for a considerable time sold its products "Flexgas," which it colors red. In its petition it says this gasoline is a superior fuel, with octane rating of 74, and that its anti-knock quality is the result of a method of refining.

The new Colorado law provides that "the art of coloring motor fuel offered for sale is hereby prohibited except when such coloring is used to identify special qualities and then only under a license specifying the special qualities claimed, such license to be granted by the state inspector of oils after an investigation of the claimed special qualities, which license may be on forms prescribed by the state inspector of oils. If at any time after the granting of such license it is found by said inspector that the licensee is offering for sale a motor fuel containing such coloring, which does not possess the special qualities upon which the license was granted, the said inspector shall forthwith cancel such license."

The Derby company asserts that it made due application for license to sell its "Flexgas" in Colorado but that the inspector has not acted upon it. The petition asserts that Duce has told others that the gasoline did not contain the additional substances that would entitle the company to color it and that since he had given another company a license o sell red gasoline with octane rating of 74, Derby was not entitled to color its gasoline. The petition further asserts that although Duce told the Derby company to go ahead until he acted on the application, and his deputies have talked to Derby's dealer customers and given them the impression that if they continue to sell "Flexgas" colored red, they might be fined.

Temporary injunction is asked against Duce and his agents to keep them from interfering with Derby's business and a permanent order against refusing to issue the license. In the event the court holds that the issuing of a license is discretionary with the inspector, it is asked to declare that part of the law pertaining to coloring gasoline to be unconstitutional.

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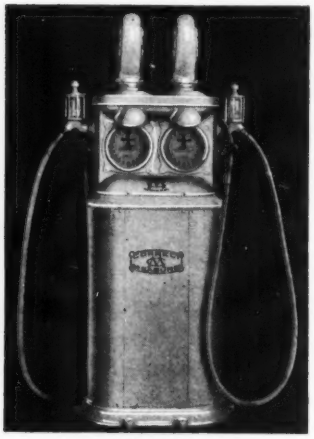
Yours for better SERVICE

ELECTRIC CORRECT-O-METER

Motor is started by raising the nozzle hook and is shut off by hanging up the nozzle. Our own powerful pumping unit is operated by V-Belt drive from the motor. Simple, sturdy mechanism provides long satisfactory service. Single connection to storage simplifies installation. Equipped with either Positive Displacement or Disc Type flow meter, as desired.

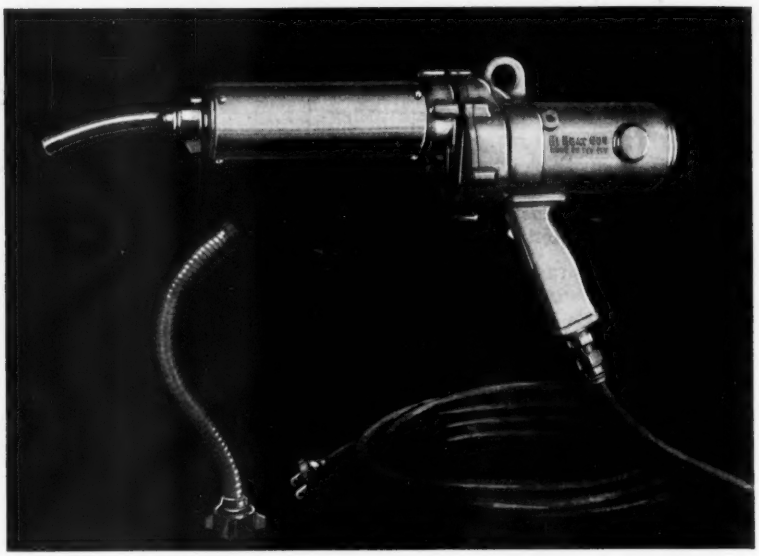


DUPLEX CORRECT-O-METER

The Duplex comprises two complete metering systems in one attractive housing. Besides being able to furnish two different types of gasoline, the Duplex is ideal, where island space is limited, the dimensions of the lower housing being only 16" x 30".

Lower housing provides ample space for advertising and can be removed with ease.

The Duplex is equipped with either Positive Displacement or Disc Type flow, as desired



THE HI-HEAT GUN

With the advent of cold weather the Hi-Heat Gun will prove a valuable means for increasing grease and oil sales. Sturdily constructed, the Hi-Heat Gun comes complete ready for use when attached to any light socket carrying 110 volt, either A.C. or D.C. The Hi-Heat Gun develops a temperature of 500 degrees F. with amazing speed. Your customers will quickly appreciate this improved service.

Here are a few of the uses for which the Hi-Heat Gun is perfectly adapted:

- Reducing grease in differentials and transmissions to thin oil.
- Thawing frozen radiators, water pumps and oil lines.
- Softening grease in "frozen" shackle bolts and other lubricating points.
- Drying wet brake drums.

Get your Hi-Heat Gun now. Cash in on the change to winter lubricants. Write for complete details today.

●

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